

**Installation Restoration Program  
Final Semi-Annual Ground Water Monitoring Report  
for the December 1996 Round**

**162nd Fighter Wing  
Arizona Air National Guard  
Tucson International Airport Area Superfund Site  
Tucson, Arizona**

**June 1997**

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## LIST OF ACRONYMS

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<u>Acronym</u>	<u>Definition</u>
AANG	Arizona Air National Guard
ERM	ERM-West, Inc.
TCE	trichloroethylene
PCE	tetrachloroethylene
VOC	volatile organic compound
µg/l	micrograms per liter

## SECTION 1.0

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## INTRODUCTION

ERM-West, Inc., (ERM) conducted a ground water monitoring round during November/December 1996 as part of the semi-annual ground water monitoring program at the Arizona Air National Guard (AANG) Base in Tucson, Arizona. The work was performed under contract DAHA90-94-D-0014 between ERM and the National Guard Bureau, Departments of the Army and Air Force. The scope of the monitoring round and methods utilized are described in ERM's workplan entitled: *Final Workplan for Ground Water Monitoring 162nd Fighter Group, Arizona Air National Guard, Tucson International Airport, Tucson, Arizona* (August 1996).

Ground water samples and ground water level measurements were collected from 29 monitoring wells located within the AANG Base. Ground water samples were also collected from two off-site private wells and from two Tucson Water monitoring wells.

Previous ground water monitoring at the AANG Base was performed by ERM and by Oak Ridge National Laboratory/Environmental Technology Section. Previous data collected at the AANG Base are summarized in the following documents:

- ORNL/ETS's *Technical Memorandum, October 1994, Ground Water Sampling Results* (February 1995);
- ORNL/ETS's *Final Installation Remedial Investigation Report* (June 1995);
- ERM's *Final Semi-Annual Ground Water Monitoring Report* (September 1995);
- ERM's *Final Semi-Annual Ground Water Monitoring Report for the December 1995 Round* (May 1996); and
- ERM's *Final Semi-Annual Ground Water Monitoring Report for the June 1996 Round* (October 1996).

This report presents a summary of water level and water quality data collected by ERM during the November/December 1996 semi-annual ground water monitoring round. For the purpose of this report, the



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data presented will be referred to as collected during the "December 1996" sampling round.

## SECTION 2.0

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**MONITORING ACTIVITIES**

This section provides a summary of ground water monitoring activities performed during the December 1996 semi-annual ground water monitoring round at the AANG Base. Figure 2-1 shows the locations of wells included in the ground water monitoring program.

**2.1 December 1996 Monitoring Round**

The December 1996 monitoring round was comprised of ground water level measurements and ground water sample collection and analysis.

**2.2 Ground Water Level Measurements**

Static ground water levels were measured and recorded by field personnel using an electric static water level indicator capable of producing measurements accurate to within  $\pm 0.01$  foot. Measurements were made from established reference points marked on top of each well casing by previous contractors at the Base. Static ground water levels were measured at on-Base monitoring wells from November 21 through December 3, 1996.

**2.3 Ground Water Sample Collection**

ERM collected ground water quality samples from 28 on-Base monitoring wells and from the two private wells (Kestler 1 and Kestler 2) during two time periods: November 20 through November 22, 1996, and December 2 through December 3, 1996. Sampling activities were temporarily halted on November 22, 1996, due to malfunctioning submersible pumps. Upon discovery of the malfunctioning pumps, ERM procured new pumping equipment and remobilized to complete the sampling round on December 2 and 3, 1996. Ground water samples were collected from monitoring wells WR-055B and WR-072S by Tucson Water personnel on November 25, 1996.

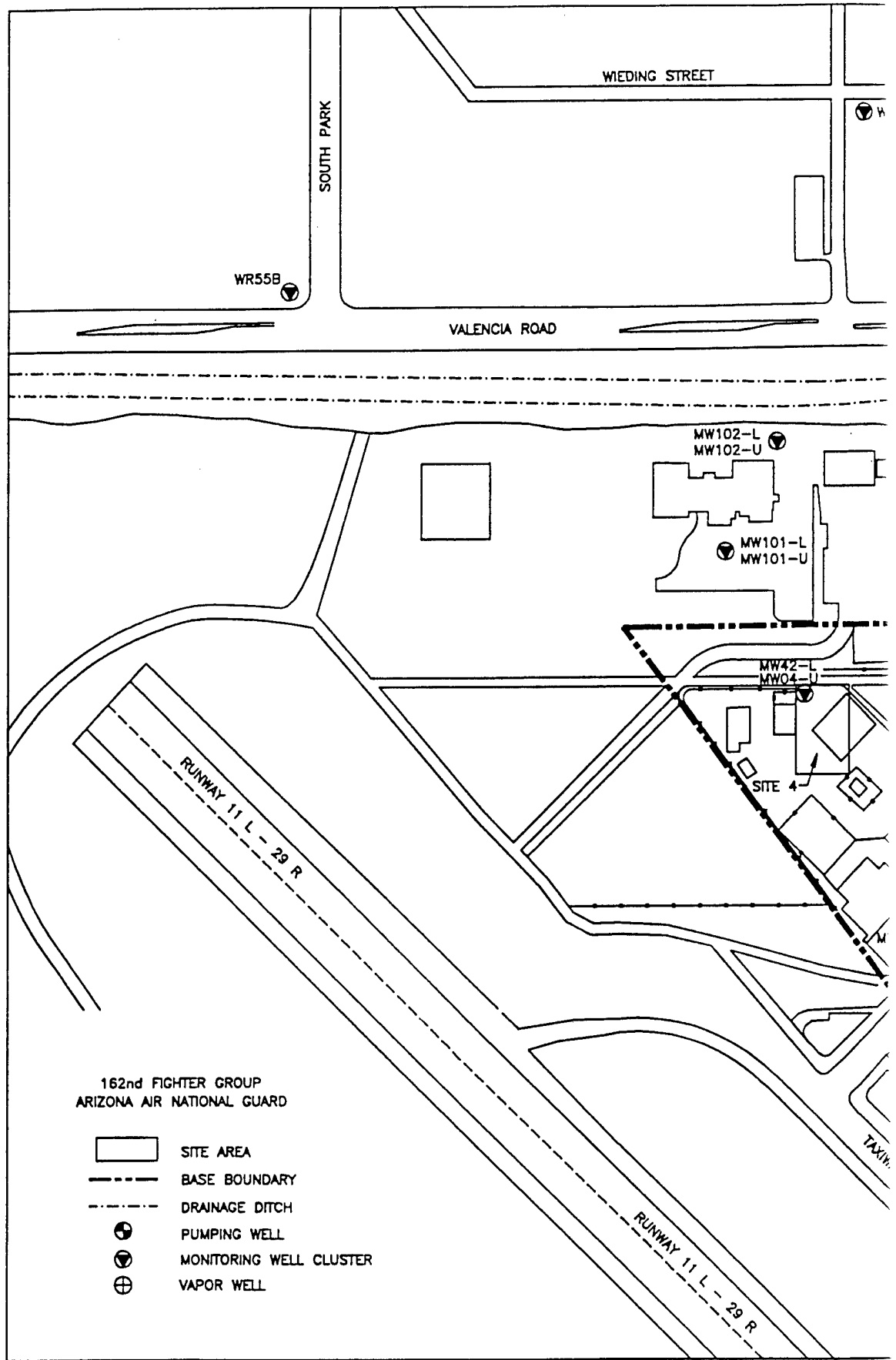
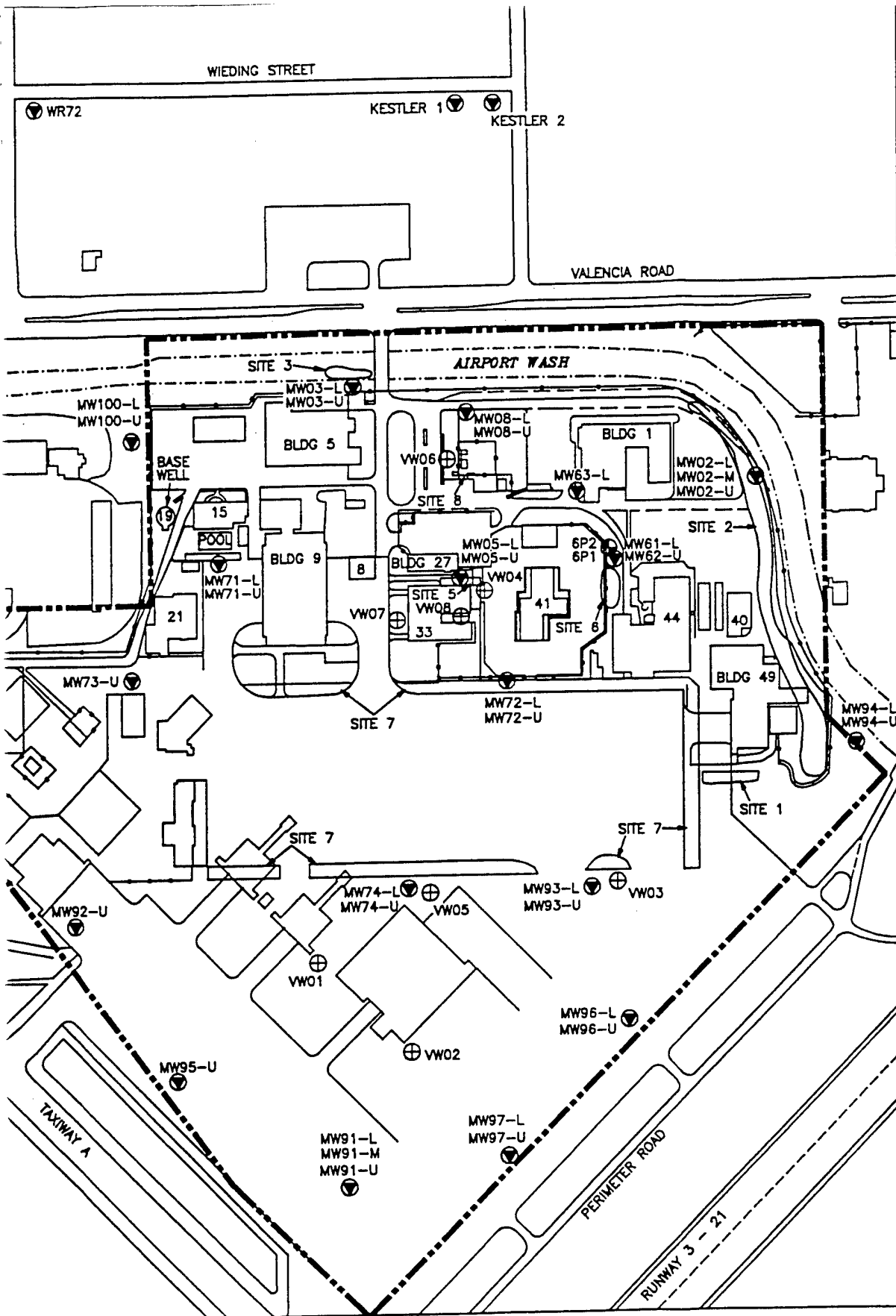


FIGURE 2-1

①

WELL L



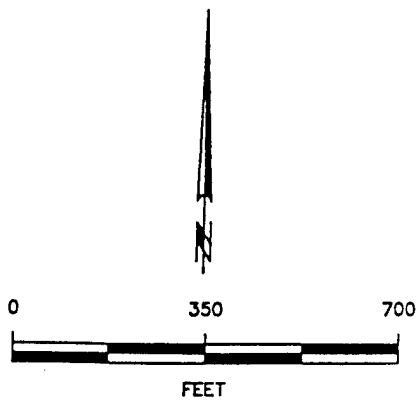
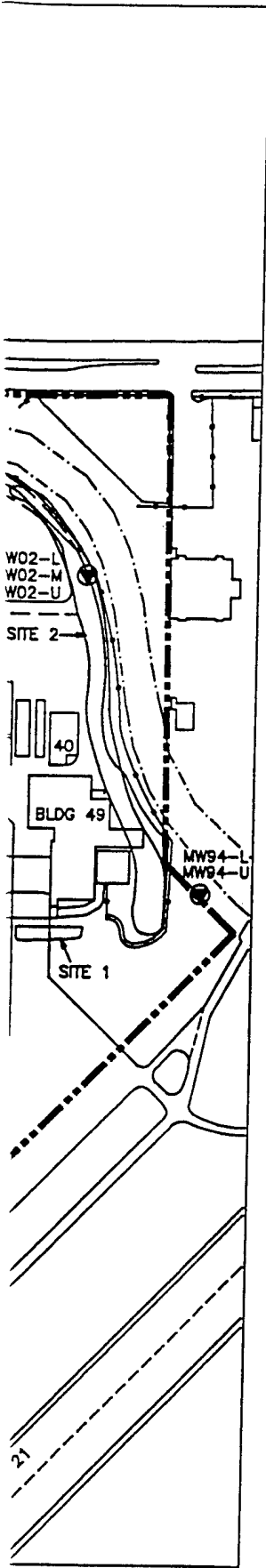
LL LOCATION MAP

2



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Each on-Base monitoring well was purged using a 2-inch, stainless steel, submersible pump. At least three well volumes were purged prior to ground water sample collection. The temperature, specific conductivity, and pH of ground water were recorded during the purging process to ensure their stabilization prior to sample collection. Ground water samples were collected from each monitoring well with the 2-inch submersible pumps. Permanent pumps in the two private wells (Kestler 1 and Kestler 2) were activated by the well owner and allowed to run for at least 2 hours prior to sampling.

All samples were collected in pre-preserved, 40-milliliter glass, sample vials. All samples were labeled in the field and placed into ice-chilled coolers immediately following their collection. Chain-of-Custody Records were prepared and included in the cooler that was delivered to the analytical laboratory, copies of these records are attached in Appendix A.

## 2.4 Ground Water Analyses

Ground water samples collected by ERM were analyzed for volatile organic compounds (VOCs) using the United States Environmental Protection Agency Method 8010 by Del Mar Laboratory under subcontract to Quanterra Environmental Services of Santa Ana, California. Del Mar Laboratory was utilized by Quanterra Environmental Services due to laboratory work overload.

Ground water samples collected by Tucson Water personnel from monitoring wells WR-055B and WR-072S were analyzed for VOCs using United States Environmental Protection Agency Method 524.2.

## 2.5 Quality Assurance/Quality Control Procedures

Quality assurance/quality control procedures followed during the collection of ground water samples are outlined in ERM's *Final Workplan for Ground Water Monitoring* (August 1996). Field quality assurance/quality control samples collected during ground water monitoring activities included the following:

- Trip blank collected at the frequency of one per shipped cooler per day.
- Field and equipment blanks were collected at the frequency of 10 percent of the number of original samples. American Society for

Testing and Materials Type II water was used during decontamination activities.

- Duplicate samples were collected at the frequency of 10 percent of the total number of samples collected. Three duplicate samples were collected during the December 1996 ground water monitoring round at monitoring wells MW71-L, MW97-L, and MW102-L.
- One matrix spike/matrix spike duplicate sample was designated for every 20 samples collected. One matrix spike/matrix spike duplicate sample was collected at MW96-L during the December 1996 ground water monitoring round.
- Daily pH checks were conducted to ensure that all samples were preserved to pH 2 or less.

## SECTION 3.0

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## *RESULTS AND DISCUSSION*

This section provides a discussion of the results of the ground water level and ground water sampling activities performed during the December 1996 semi-annual ground water monitoring round at the AANG Base.

### 3.1 Ground Water Levels

Ground water elevations were calculated based on ground water levels measured in the AANG Base monitoring wells during the December 1996 monitoring event. Monitoring well construction details are summarized in Table 3-1. Ground water elevation data are summarized in Table 3-2.

ERM prepared ground water elevation contour maps based on ground water level data collected during December 1996 for the upper and lower subunits of the upper regional aquifer (Figures 3-1 and 3-2). Both maps show a general northwest direction of ground water flow. This is consistent with previous ground water level measurements at the AANG Base.

Ground water elevations measured in both upper and lower subunits showed that elevations have generally increased since the previous sampling round in June 1996. The average increase was measured to be approximately 0.7 feet.

### 3.2 Ground Water Quality

Analytical data reports and Chain-of-Custody Records for ground water samples collected during the December 1996 ground water monitoring round are included in Appendix A. A summary of ground water analyses for trichloroethylene (TCE) is included in Table 3-3.

TCE was not detected in samples collected from private wells identified as Kestler 1 and Kestler 2 or in Tucson Water monitoring well WR-055B. TCE was detected at a concentration of 2.4 micrograms per



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TABLE 3-1

*Monitoring Well Construction Data  
162nd Fighter Wing, Arizona Air National Guard  
Tucson International Airport  
Tucson, Arizona*

Monitoring Well Identifier	Easting (feet)	Northing (feet)	Measuring Point Elevation (feet above mean sea level)	Total Depth (feet below measuring point)	Screened Interval (feet)
MW02-U	800623.89	413427.35	2555.96	101.00	85.5-95.5
MW02-M	800627.31	413416.53	2555.98	117.00	111.5-116.5
MW02-L	800630.49	413407.07	2556.33	138.50	128-138
MW03-U	779628.17	413632.95	2548.98	100.91	91.5-100.9
MW03-L	799643.52	413632.71	2549.30	136.56	127-136.56
MW04-U	798719.37	412959.88	2548.73	100.78	95.5-100.78
MW42-L	798710.66	412950.34	2548.57	141.65	132.7-141.65
MW05-U	799891.85	413171.63	2551.21	101.03	91.0-101.03
MW05-L	799902.49	413172.30	2551.21	136.82	128.0-136.82
MW08-U	799906.47	413567.98	2551.16	103.00	88-98
MW08-L	799918.87	413567.70	2551.18	138.00	127.8-137.8
MW61-L	800281.75	413214.18	2553.28	158.00	133-143
MW62-U	800270.57	413210.95	2553.32	104.00	93.8-103.8
MW63-L	800189.29	413376.51	2554.12	135.00	130-135
MW71-U	799312.91	413216.71	2550.96	103.70	89.0-103.70
MW71-L	799298.90	413215.95	2550.98	133.00	122.5-133.0
MW72-U	800015.82	412919.60	2554.31	98.86	92.5-98.86
MW72-L	800026.36	412919.02	2554.48	137.19	133.0-137.19
MW73-U	799094.82	412933.29	2550.27	109.13	99.5-109.13
MW74-U	799787.64	412421.42	2555.31	99.32	89.5-99.32
MW74-L	799773.04	412421.14	2555.58	134.55	125.0-134.55
MW91-U	799626.13	411720.20	2560.36	98.00	92.5-97.5
MW91-M	799625.47	411710.10	2560.47	120.00	114.7-119.7
MW91-L	799624.78	411699.68	2560.49	146.00	136-146
MW92-U	798927.93	412333.71	2554.96	98.50	93.5-98.5
MW93-U	800229.85	412430.32	2558.75	96.95	90.5-96.95
MW93-L	800228.32	412420.22	2558.81	139.23	125.0-139.23
MW94-U	800857.38	412774.59	2557.84	106.50	90.5-106.50
MW94-L	800876.83	412762.31	2557.94	149.40	135.0-149.40

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TABLE 3-1  
(continued)

*Monitoring Well Construction Data  
162nd Fighter Wing, Arizona Air National Guard  
Tucson International Airport  
Tucson, Arizona*

Monitoring Well Identifier	Easting (feet)	Northing (feet)	Measuring Point Elevation (feet above mean sea level)	Total Depth (feet below measuring point)	Screened Interval (feet)
MW95-U	799195.49	411941.51	2558.54	107.00	102-107
MW96-U	800333.05	412088.42	2560.10	102.80	94.0-102.80
MW96-L	800340.20	412095.58	2560.13	137.00	126.0-137.0
MW97-U	800024.07	411778.36	2559.91	96.40	92.0-96.40
MW97-L	800015.24	411769.53	2559.95	136.15	127.0-136.15
MW100-U	799127.549	413498.592	2544.88	97.00	87.0-97.0
MW100-L	799128.887	413509.278	2544.86	130.00	120.0-130.0
MW101-U	798487.912	413325.133	2542.79	97.00	87.0-97.0
MW101-L	798508.635	413326.864	2542.24	140.00	125.0-135.0
MW102-U	798655.992	413537.482	2543.27	97.00	87.0-97.0
MW102-L	798636.869	413537.992	2542.89	130.00	120.0-130.0
WR-055B	--	--	2536.30	233.00	213.0-233.0
WR-072S	--	--	2544.80	190.00	110.0-190.0
KESTLER 1	--	--	--	--	--
KESTLER 2	--	--	--	--	--

-- = not available

TABLE 3-2

*Ground Water Elevation Data, June 1996 and December 1996  
162nd Fighter Wing, Arizona Air National Guard  
Tucson International Airport  
Tucson, Arizona*

Monitoring Well Identifier	Casing Elevation (feet above msl)	June 1996		November/December 1996		Change in Elevation June to December 1996 (feet)
		Depth to Ground Water (feet bmp)	Ground Water Elevation (feet above msl)	Depth to Ground Water (feet bmp)	Ground Water Elevation (feet above msl)	
MW02-U	2555.96	91.35	2464.61	90.44	2465.52	0.91
MW02-M	2555.99	91.43	2464.56	90.47	2465.52	0.96
MW02-L	2556.34	92.93	2463.41	92.63	2463.71	0.30
MW03-U	2548.98	85.47	2463.51	83.96	2465.02	1.51
MW03-L	2549.30	86.78	2462.52	86.25	2463.05	0.53
MW04-U	2548.73	85.19	2463.54	84.10	2464.63	1.09
MW42-L	2548.57	86.96	2461.61	86.21	2462.36	0.75
MW05-U	2551.18	86.16	2465.02	85.18	2466.00	0.98
MW05-L	2551.20	87.25	2463.95	86.78	2464.42	0.47
MW08-U	2551.20	87.11	2464.09	85.75	2465.45	1.36
MW08-L	2551.21	88.28	2462.93	87.78	2463.43	0.50
MW61-L	2553.31	89.56	2463.75	89.18	2464.13	0.38
MW62-U	2553.34	88.23	2465.11	87.31	2466.03	0.92
MW63-L	2554.15	90.64	2463.51	90.27	2463.88	0.37
MW71-U	2550.96	87.05	2463.91	85.83	2465.13	1.22
MW71-L	2550.98	87.73	2463.25	87.06	2463.92	0.67
MW72-U	2554.31	88.52	2465.79	87.78	2466.53	0.74
MW72-L	2554.48	88.62	2465.86	88.15	2466.33	0.47
MW73-U	2550.27	86.02	2464.25	85.10	2465.17	0.92
MW74-U	2555.31	88.54	2466.77	88.09	2467.22	0.45
MW74-L	2555.58	88.64	2466.94	88.22	2467.36	0.42
MW91-U	2560.36	93.18	2467.18	92.88	2467.48	0.30
MW91-M	2560.47	93.27	2467.20	92.96	2467.51	0.31
MW91-L	2560.49	93.23	2467.26	92.95	2467.54	0.28
MW92-U	2554.96	89.55	2465.41	89.14	2465.82	0.41
MW93-U	2558.75	91.20	2467.55	90.81	2467.94	0.39
MW93-L	2558.81	91.43	2467.38	91.06	2467.75	0.37
MW94-U	2557.84	90.60	2467.24	89.77	2468.07	0.83
MW94-L	2557.94	92.31	2465.63	92.18	2465.76	0.13
MW95-U	2558.54	92.27	2466.27	91.94	2466.6	0.33
MW96-U	2560.10	91.98	2468.12	91.68	2468.42	0.30
MW96-L	2560.13	91.98	2468.15	91.68	2468.45	0.30
MW97-U	2559.91	92.08	2467.83	91.74	2468.17	0.34
MW97-L	2559.95	92.09	2467.86	91.76	2468.19	0.33
MW100-U	2544.88	82.02	2462.86	80.54	2464.34	1.48
MW100-L	2544.86	82.88	2461.98	82.11	2462.75	0.77
MW101-U	2542.79	80.81	2461.98	79.32	2463.47	1.49
MW101-L	2542.24	81.33	2460.91	80.51	2461.73	0.82
MW102-U	2543.27	81.54	2461.73	79.82	2463.45	1.72
MW102-L	2542.89	81.84	2461.05	81.06	2461.83	0.78

bmp = below measuring point

msl = mean sea level

\*\* = not measured

TABLE 3-3

*Trichloroethylene Detected in Ground Water*  
 162nd Fighter Wing, Arizona Air National Guard  
 Tucson International Airport  
 Tucson, Arizona

Year	TCE Concentrations in micrograms per liter						
	1989				1990		
Monitoring Well Identifier	June	July	October	November	April	July	October
MW02-U	ND	ND	NS	NS	ND	ND	ND
MW02-M	ND	1.3	0.9	1.0	ND	ND	ND
MW02-L	ND	ND	NS	NS	ND	ND	ND
MW03-U	ND	ND	NS	NS	ND	ND	ND
MW03-L	ND	ND	NS	NS	ND	ND	ND
MW04-U	5.5	5.4	6.4	6.1	6.3	7.5	6.4/6.4
MW42-L	ND	ND	NS	NS	3.6	6.6/7.4	9.2
MW05-U	0.8	1.2	1.4/1.5	1.2	1.4	2.4	1.6
MW05-L	5.4	4.3	4.3	5.2	4.3	3.5	4.6
MW61-L	ND	ND	NS	NS	ND	ND	ND
MW62-U	ND	ND	NS	NS	ND	ND	ND
MW63-L	ND	ND	NS	NS	ND	ND	ND
MW71-U	**	**	5.2	5.3/6.2	4.3	5.3	4.3
MW71-L	**	**	41.0	NA	35.0/35.0	35.0	29.0/31.0
MW72-U	**	**	2.0/2.2	2.1	2.1	2.2	1.8
MW72-L	**	**	3.7	4.2	3.4	2.5/2.6	2.6
MW73-U	**	**	18.0	21.0	14.0/14.0	19.0	17.0/19.0
MW74-U	**	**	46.0	37.0/38.0	38.0	28.0	27.0/28.0
MW74-L	**	**	32.0	26.0	19.0/20.0	21.0	16.0
MW08-U	ND	ND	NS	NS	ND	ND	ND
MW08-L	ND	ND	NS	NS	ND	ND	ND
MW91-U	ND	ND	NS	ND	ND	ND	ND
MW91-M	ND	ND	NS	ND	ND	ND	ND
MW91-L	ND	ND	NS	ND	ND	ND	ND
MW92-U	11.0	16.0	20.0	18.0	16.0	12.0	16.0
MW93-U	0.6	ND	0.6	0.6	ND	ND	ND
MW93-L	7.3	9.6	13.0	10.0	9.1	7.7	8.1
MW94-U	ND	ND	NS	NS	ND	ND	ND
MW94-L	ND	ND	NS	NS	ND	ND	ND
MW95-U	**	**	ND	ND	ND	ND	ND
MW96-U	**	**	13.0	13.0	11.0	8.9/9.4	10.0
MW96-L	**	**	21.0	20.0	15.0/16.0	12.0	15.0
MW97-U	**	**	0.9	0.6	ND	ND	ND
MW97-L	**	**	1.5	1.6	ND	1.0	ND
MW100-U	**	**	**	**	**	**	**
MW100-L	**	**	**	**	**	**	**
MW101-U	**	**	**	**	**	**	**
MW101-L	**	**	**	**	**	**	**
MW102-U	**	**	**	**	**	**	**
MW102-L	**	**	**	**	**	**	**
BASE	NS	26.0	31.0	29.0	19.0	19.0/20.0	17.0/19.0
WR-055B	NS	NS	NS	NS	NS	NS	NS
WR-072S	NS	NS	NS	NS	NS	NS	NS
KESTLER 1	NS	NS	NS	NS	NS	NS	NS
KESTLER 2	NS	NS	NS	NS	NS	NS	NS

Values separated by a slash (/) indicate results from original/duplicate samples.

ND = not detected; NS = not sampled; NA = not analyzed by laboratory

J = Estimated quantity; quality control criteria not met.

\*\* = Wells installed after sampling event

# = Reanalysis

\* = Split sample result

U = Upper subunit monitoring well

L = Lower subunit monitoring well

M = Middle subunit monitoring well

TCE = trichloroethylene

TABLE 3-3 (Continued)

*Trichloroethylene Detected in Ground Water  
162nd Fighter Wing, Arizona Air National Guard  
Tucson International Airport  
Tucson, Arizona*

Year	TCE Concentrations in micrograms per liter					
	1993		1994		1995	
Monitoring Well Identifier	February	September	February	October	June	December
MW02-U	ND	NS	NS	NS	NS	NS
MW02-M	ND	NS	NS	NS	NS	NS
MW02-L	ND	NS	NS	NS	NS	NS
MW03-U	ND	ND	0.11	0.13 J	ND/ND*	NS
MW03-L	1.2	0.8	1.4	ND	ND/ND*	29.0
MW04-U	13.8	8.5	8.7	6.0	12.0/10.0*	7.5
MW42-L	21.0/20.0	15.0	17.0	17.0	19.0/17.0*	35.0
MW05-U	8.4	4.5/3.0	8.5	11.0	11.0/9.0*	15.0
MW05-L	4.6	3.7	2.7	4.3	5.9/5.0*	16.0/18.0
MW61-L	ND	NS	NS	NS	NS	NS
MW62-U	ND	NS	NS	NS	NS	NS
MW63-L	ND	NS	NS	NS	NS	NS
MW71-U	7.1/7.1	5.0	7.2	6.8	8.5/7.0*	7.9
MW71-L	25.0	31.0/16.0	15.0	14.0	20/20	32.0
MW72-U	3.0	1.9	2.8	3.2	3.8/3.0*	1.6
MW72-L	2.6	2.3	2.6	2.8	3.1	38.0/42.0#
MW73-U	25.0	34.0	16.0/17.0	17.0	15.0	23.0
MW74-U	29.0/32.0	25.0	15.0	1.2/1.1	11.0	20.0
MW74-L	18.0	13.0	14.0	15.0	20.0	23.0/29.0
MW08-U	ND	NS	NS	NS	NS	NS
MW08-L	ND	NS	NS	NS	NS	NS
MW91-U	ND	NS	NS	NS	NS	NS
MW91-M	ND	NS	NS	NS	NS	NS
MW91-L	ND	NS	NS	NS	NS	NS
MW92-U	15.0	8.8	9.2/8.9	9.1	11.0	21.0
MW93-U	2.1	1.3	Sample Broken	1.6	2.5	13.0
MW93-L	9.1	8.8	9.0/8.8	11.0	10.0	18.0
MW94-U	ND	ND	ND	ND	ND	17.0
MW94-L	2.5	0.5	0.6	0.5	1.3/1.2	12.0
MW95-U	ND	NS	NS	NS	NS	NS
MW96-U	19.0	14.0/14.0	21.0	15.0/14.0	16.0	40.0
MW96-L	ND/ND	15.0	20.0	17.0	22/22	34.0
MW97-U	ND	0.3	0.3	ND	1.0	1.8
MW97-L	ND	ND	0.6	0.5	ND/ND	25.0
MW100-U	**	**	**	**	**	19.0/15.0
MW100-L	**	**	**	**	**	20.0
MW101-U	**	**	**	**	**	25.0
MW101-L	**	**	**	**	**	12.0
MW102-U	**	**	**	**	**	27.0
MW102-L	**	**	**	**	**	18.0
BASE	NS	NS	NS	NS	NS	NS
WR-055B	ND	NS	NS	0.5 J	0.6 (May 1995)	ND (August 1995)
WR-072S	0.3	ND	NS	0.5 J	ND (May 1995)	0.7 (November 1995)
KESTLER 1	ND	0.1	ND	ND	ND/ND*	ND
KESTLER 2	ND	0.1	ND	ND	ND/ND*	ND

Values separated by a slash (/) indicate results from original/duplicate samples.

ND = not detected; NS = not sampled; NA = not analyzed by laboratory

J = Estimated quantity; quality control criteria not met.

\*\* = Wells installed after sampling event

# = Reanalysis

\* = Split sample result

U = Upper subunit monitoring well

L = Lower subunit monitoring well

M = Middle subunit monitoring well

TCE = trichloroethylene

TABLE 3-3 (Continued)  
*Trichloroethylene Detected in Ground Water*  
 162nd Fighter Wing, Arizona Air National Guard  
 Tucson International Airport  
 Tucson, Arizona

Year	TCE concentrations in micrograms per liter		
	1996		
Monitoring Well Identifier	January	June	November/December
MW02-U	NS	1.0	NS
MW02-M	NS	NS	NS
MW02-L	NS	5.8	NS
MW03-U	NS	ND/ND	ND
MW03-L	NS	5.0	ND
MW04-U	NS	NS	11.0
MW42-L	NS	NS	16.0
MW05-U	NS	13.0	9.9
MW05-L	NS	8.6	7.8
MW61-L	NS	NS	NS
MW62-U	NS	NS	NS
MW63-L	NS	NS	NS
MW71-U	NS	NS	9.3
MW71-L	NS	NS	14/12
MW72-U	NS	3.5	3.6
MW72-L	4.3/6.6*	12.0	3.0
MW73-U	NS	NS	14.0
MW74-U	NS	11.0	3.9
MW74-L	NS	16.0	15.0
MW08-U	NS	NS	NS
MW08-L	NS	5.7/4.8	NS
MW91-U	NS	NS	NS
MW91-M	NS	NS	NS
MW91-L	NS	1.9	NS
MW92-U	NS	11.0	9.8
MW93-U	NS	1.9	3.1
MW93-L	NS	18.0	19.0
MW94-U	ND	ND	ND
MW94-L	NS	3 J	ND
MW95-U	NS	ND	NS
MW96-U	NS	16.0	18.0
MW96-L	NS	20.0	22.0
MW97-U	NS	ND	ND
MW97-L	NS	2.1	1.1/1.0
MW100-U	NS	5.6	7.1
MW100-L	NS	14.0	16.0
MW101-U	NS	4.0	6.6
MW101-L	NS	10.0	12.0
MW102-U	NS	18/17	26.0
MW102-L	NS	11.0	12/11
BASE	NS	NS	NS
WR-055B	NS	ND	ND
WR-072S	NS	0.9/1.0	2.4
KESTLER 1	NS	ND	ND
KESTLER 2	NS	ND	ND

Values separated by a slash (/) indicate results from original/duplicate samples.

ND = not detected; NS = not sampled; NA = not analyzed by laboratory

J = Estimated quantity; quality control criteria not met.

\*\* = Wells installed after sampling event

# = Reanalysis

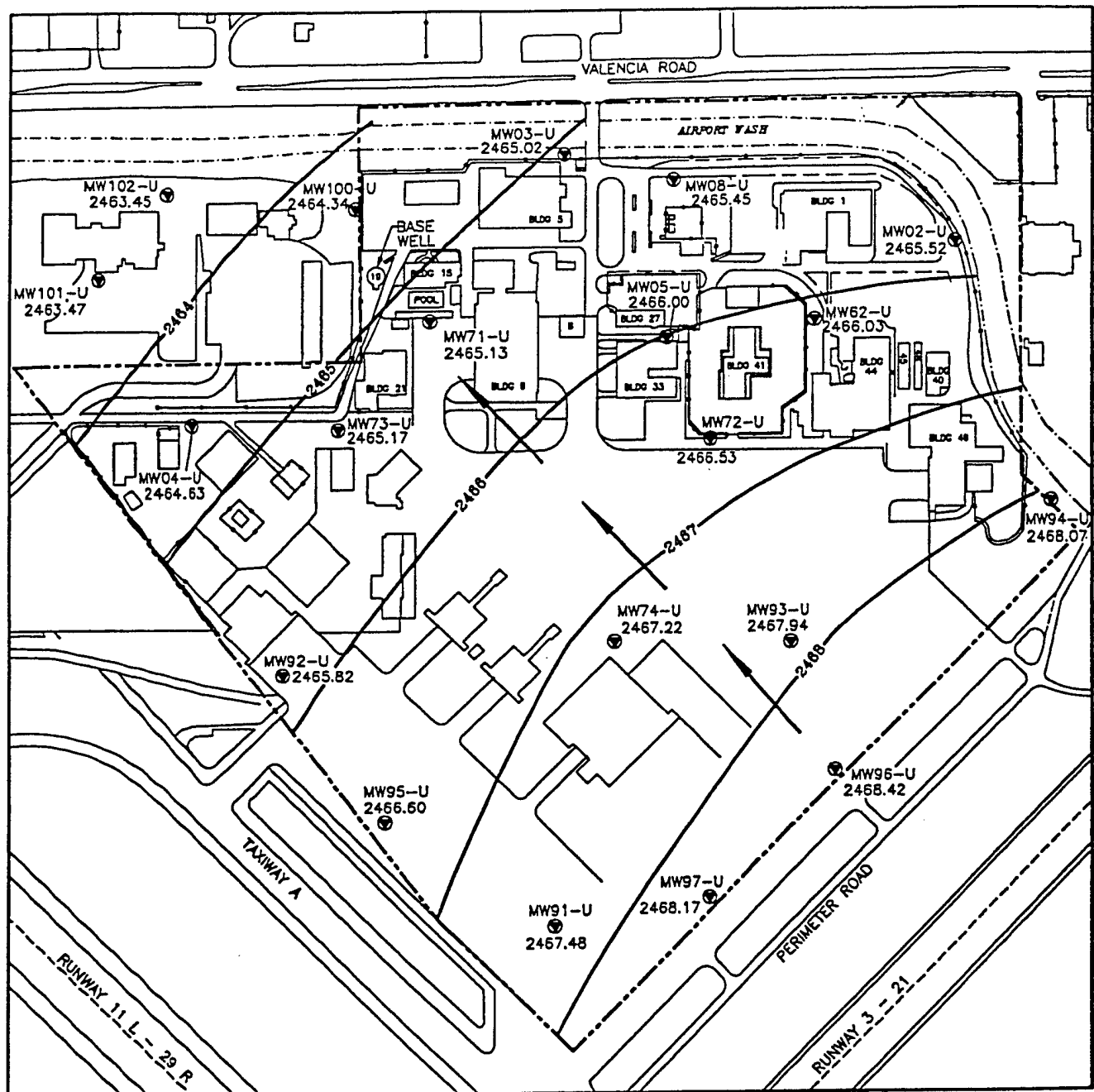
\* = Split sample result

U = Upper subunit monitoring well

L = Lower subunit monitoring well

M = Middle subunit monitoring well

TCE = trichloroethylene



### EXPLANATION

POTENTIOMETRIC SURFACE (DECEMBER, 1996)

- UPPER COMPLECTIONS
- 2485— CONTOUR INTERVAL = 1 ft
- BASE BOUNDARY
- - - DRAINAGE DITCH
- ⊙ MONITORING WELL LOCATION
- GROUNDWATER FLOW DIRECTION
- 2468.17 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

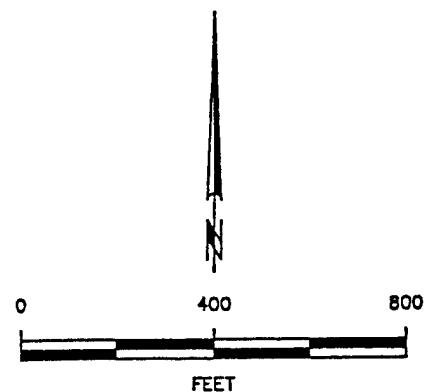
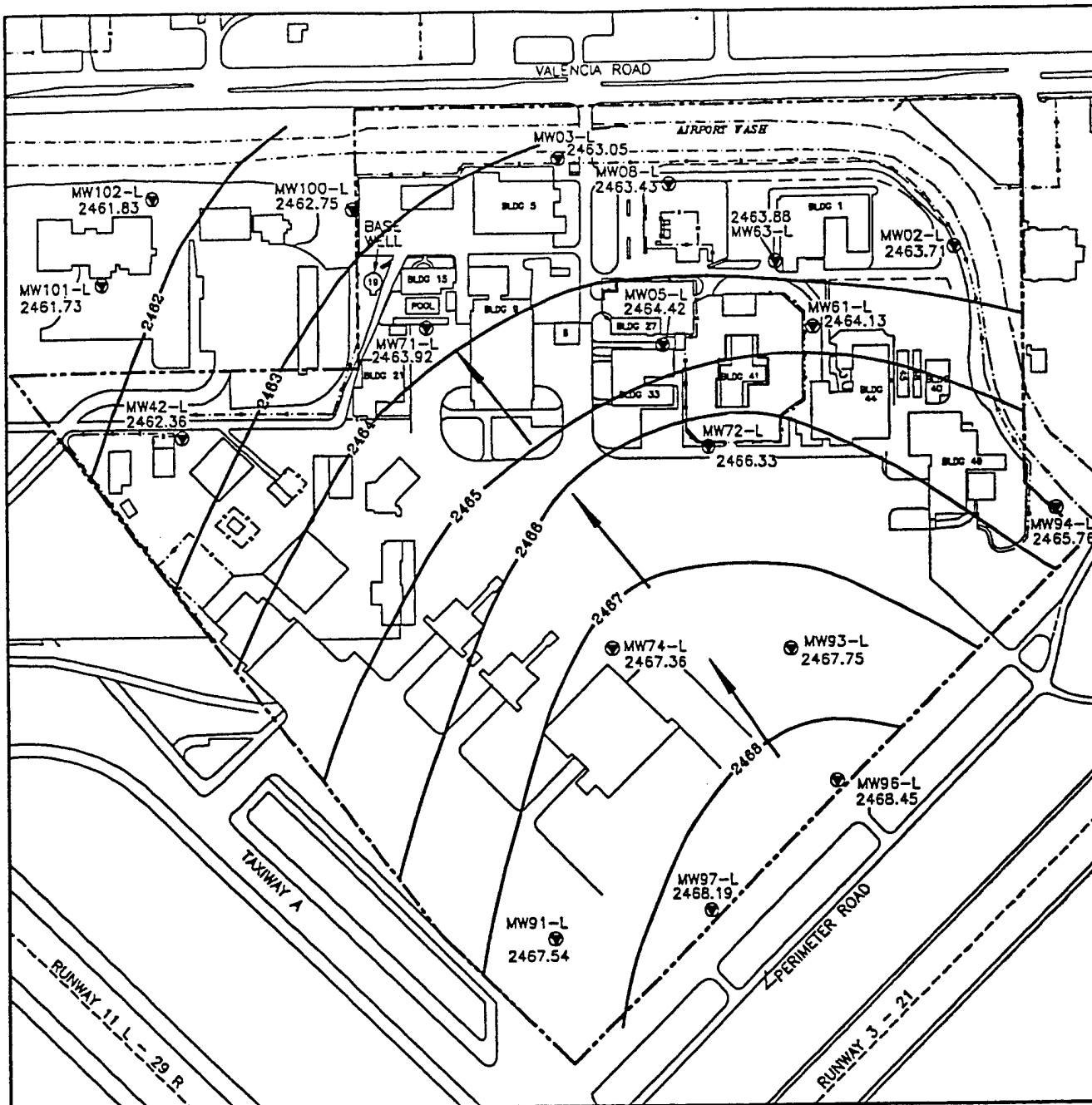


FIGURE 3-1

POTENTIOMETRIC SURFACE OF THE  
UPPER SUBUNIT OF THE UPPER  
REGIONAL AQUIFER (DECEMBER 1996)

C:\ERM\TUANG\9709\9709F3-1





## EXPLANATION

POTENTIOMETRIC SURFACE (DECEMBER, 1996)

LOWER COMPLETIONS

- 2465 CONTOUR INTERVAL = 1 ft
- BASE BOUNDARY
- DRAINAGE DITCH
- MONITORING WELL LOCATION
- GROUNDWATER FLOW DIRECTION
- 2467.54 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

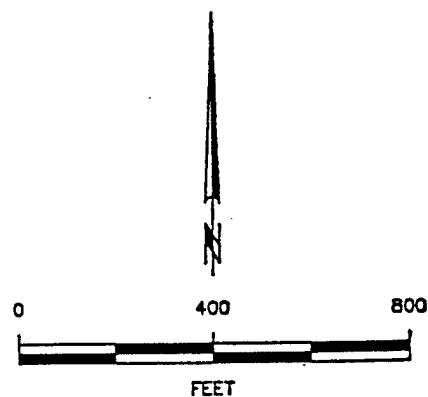


FIGURE 3-2

POTENTIOMETRIC SURFACE OF THE  
LOWER SUBUNIT OF THE UPPER  
REGIONAL AQUIFER (DECEMBER 1996)



liter ( $\mu\text{g}/\text{l}$ ) in the ground water sample collected from Tucson Water monitoring well WR-072S. This well showed a concentration of 1.0  $\mu\text{g}/\text{l}$  for the June 1996 monitoring round.

TCE concentrations detected in ground water samples collected from upper subunit monitoring wells ranged from 3.1 to 26.0  $\mu\text{g}/\text{l}$ . The highest concentration of TCE in upper subunit ground water was detected in the sample collected from monitoring well MW102-U. TCE concentrations detected in ground water samples collected from lower subunit monitoring wells ranged from 1.0 to 22.0  $\mu\text{g}/\text{l}$ . The highest concentration of TCE in lower subunit ground water was detected in the sample collected from monitoring well MW96-L. TCE was not detected in ground water samples collected from monitoring wells MW03-U, MW03-L, MW94-U, MW94-L, or MW97-U. Figures 3-3 and 3-4 are isoconcentration contour maps showing the concentrations of TCE in the upper and lower ground water subunits, respectively. Figure 3-5 presents TCE concentration hydrographs for selected upper and lower subunit monitoring wells.

TCE concentrations detected in ground water samples were similar to those in previous sampling rounds with the exception of the December 1995 sampling round. As has been noted during previous monitoring rounds, the average TCE concentration in lower subunit ground water samples were generally higher than those detected in upper subunit ground water samples.

Chloroform and tetrachloroethylene (PCE) were the only additional VOCs detected in December 1996 ground water samples. Chloroform was detected at a concentration of 3.3  $\mu\text{g}/\text{l}$  in the ground water sample collected from upper subunit monitoring well MW100-U. PCE was detected in samples collected from the following five monitoring wells: MW03-L (1.8  $\mu\text{g}/\text{l}$ ), MW94U (2.1  $\mu\text{g}/\text{l}$ ), MW04-U (2.2  $\mu\text{g}/\text{l}$ ), MW71-U (2.8  $\mu\text{g}/\text{l}$ ), and MW72-U (4.1  $\mu\text{g}/\text{l}$ ). The concentrations of chloroform and PCE cited above do not exceed the current maximum contaminant levels of 5.7  $\mu\text{g}/\text{l}$  and 5.0  $\mu\text{g}/\text{l}$ , respectively.

Review of incoming data from the laboratory indicated that samples collected on December 2, 1996, were analyzed 1 day beyond the project-specific holding time of 14 days. ERM investigated the cause of the missed holding time and instituted corrective actions with the laboratory. The results of the samples collected on December 2 were compared to both the previous sampling round as well as to the results of other samples collected during the same sampling round. There was no discernible impact of the missed holding time on the detected values based on trend analysis; therefore, the values were utilized in this report without qualification.

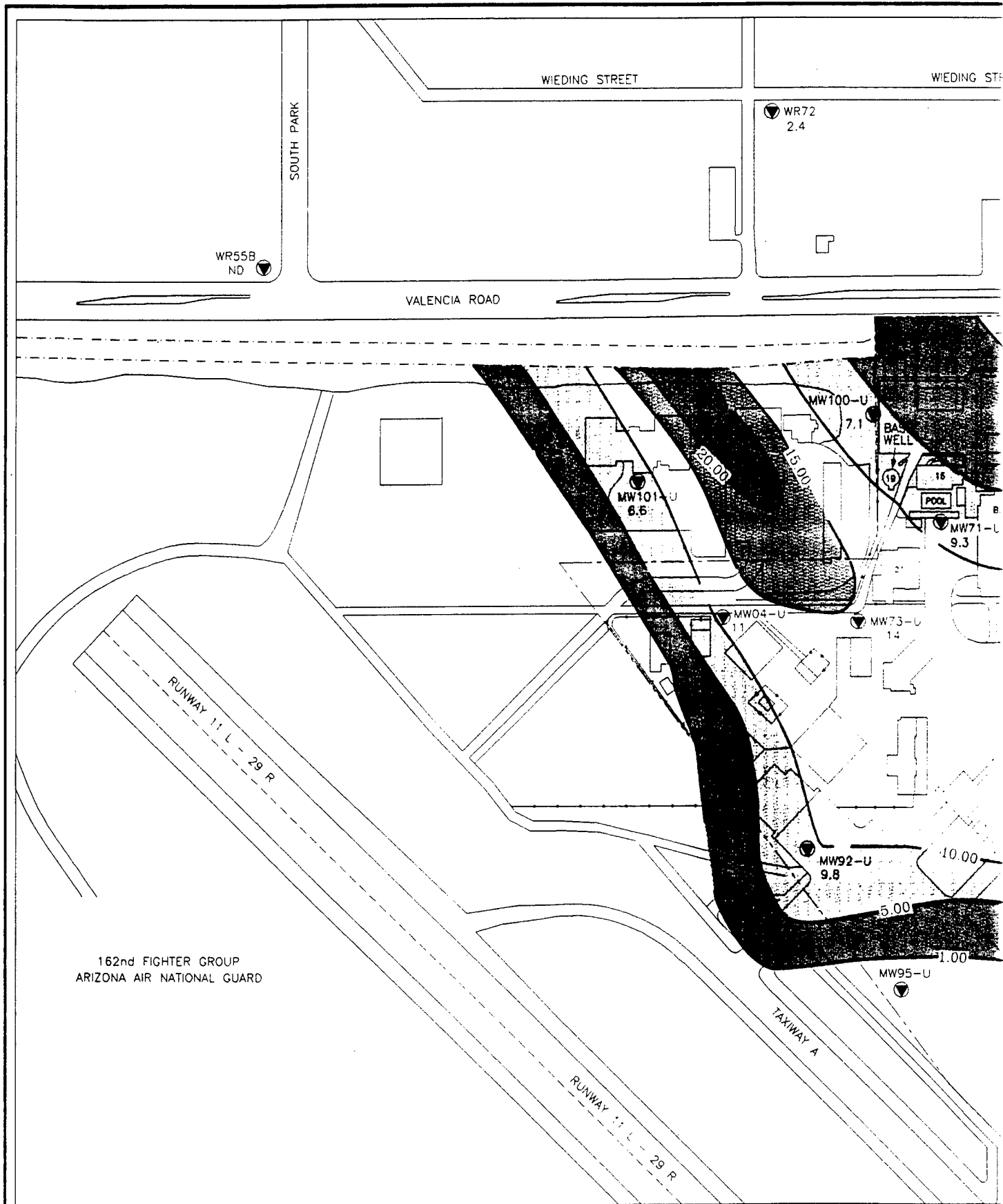
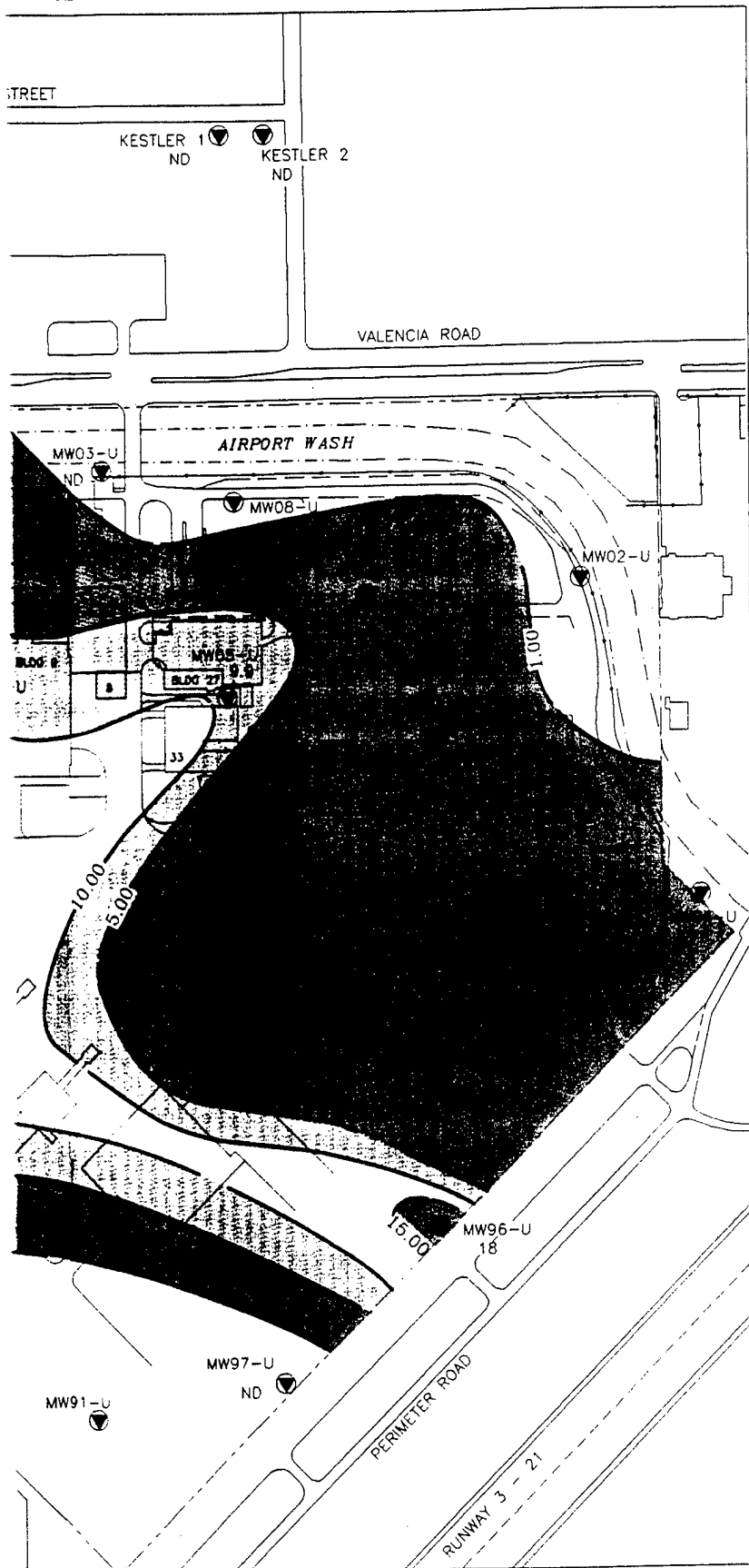


FIGURE 3-3

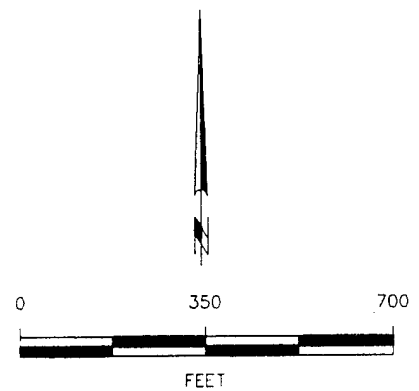
①

TCE PLUME IN  
OF THE UPPE  
(DECI



## EXPLANATION

- 10.00— ISOCONCENTRATION CONTOUR  
INTERVAL = 5 MICROGRAMS PER LITER
- BASE BOUNDARY
- DRAINAGE DITCH
- MONITORING WELL LOCATION
- 6.6 TCE CONCENTRATION IN MICROGRAMS PER LITER
- ND NONE DETECTED
- [Dark Stippled Box] TCE CONCENTRATIONS BETWEEN 1-5 MICROGRAMS PER LITER
- [Medium Stippled Box] TCE CONCENTRATIONS BETWEEN 5-10 MICROGRAMS PER LITER
- [Light Stippled Box] TCE CONCENTRATIONS BETWEEN 10-15 MICROGRAMS PER LITER
- [Horizontal Line Box] TCE CONCENTRATIONS BETWEEN 15-20 MICROGRAMS PER LITER
- [Dark Solid Box] TCE CONCENTRATIONS GREATER THAN 20 MICROGRAMS PER LITER



N THE UPPER SUBUNIT  
ER REGIONAL AQUIFER  
CEMBER 1996)

2



6 JUNE 1997

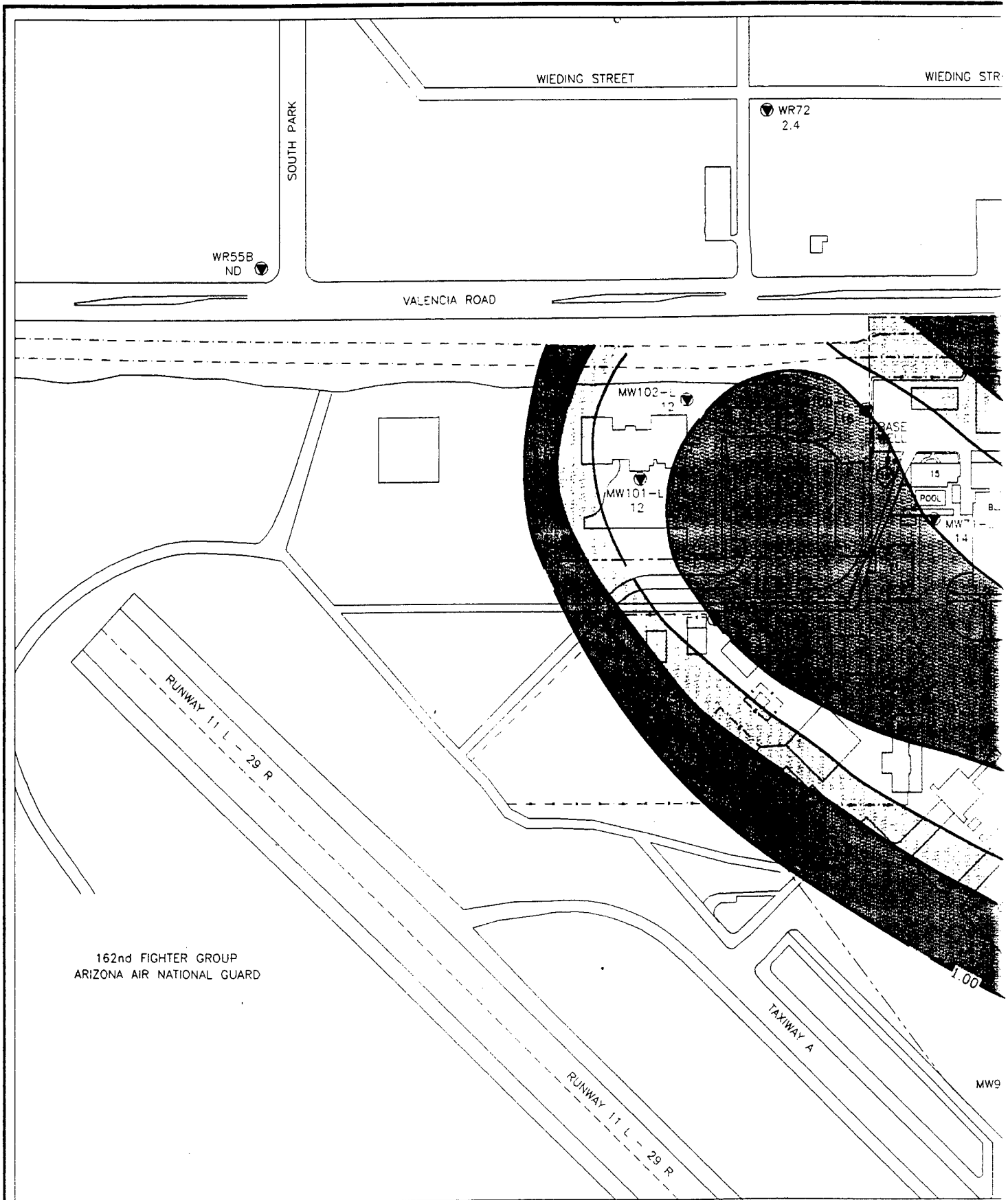
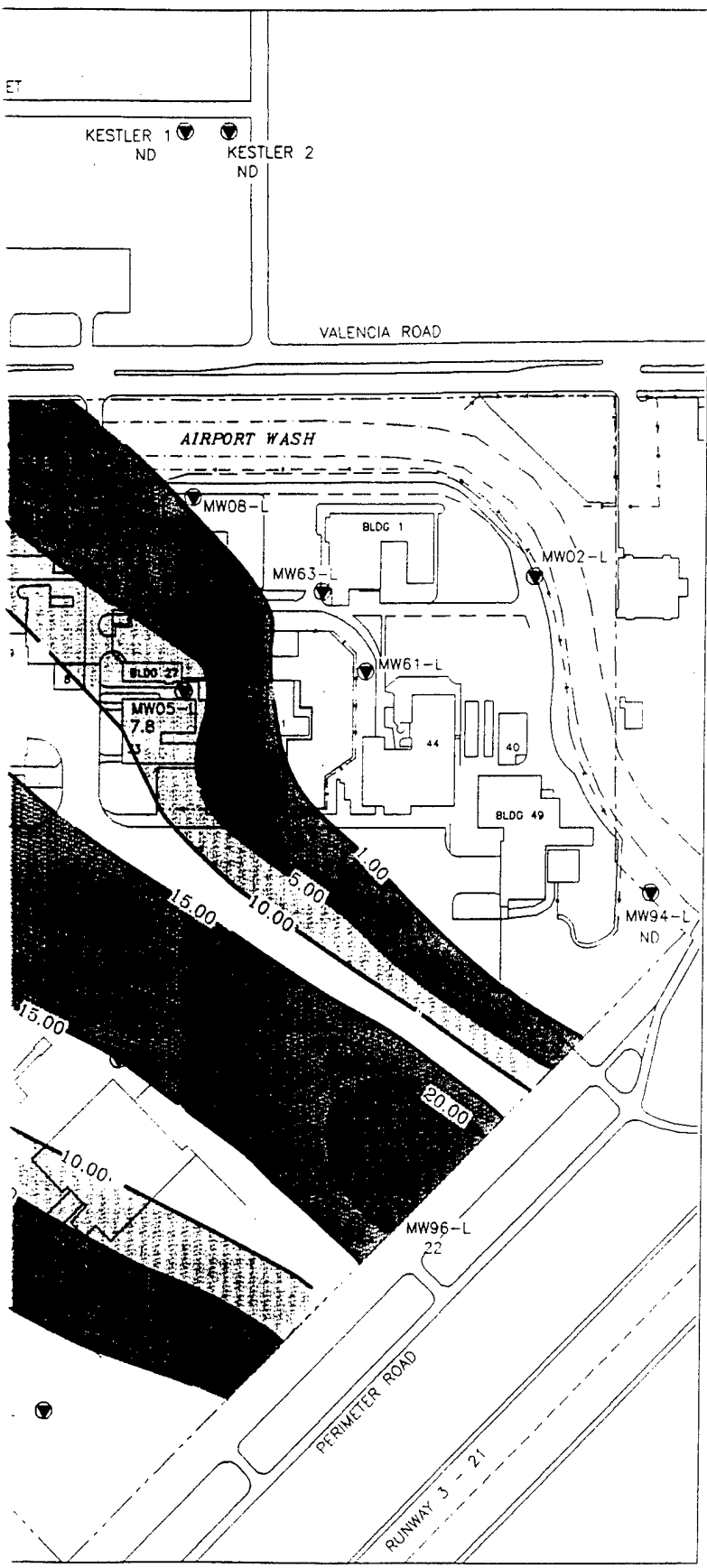


FIGURE 3-4

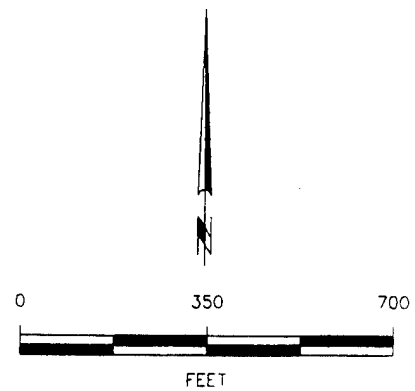
①

TCE PLUME IN  
OF THE UPPER  
(DECE



## EXPLANATION

- 10.00— ISOCONCENTRATION CONTOUR  
INTERVAL = 5 MICROGRAMS PER LITER
- BASE BOUNDARY
- - - - - DRAINAGE DITCH
- MONITORING WELL LOCATION
- 15 TCE CONCENTRATION IN MICROGRAMS PER LITER
- ND NONE DETECTED
- [Pattern: Diagonal lines /] TCE CONCENTRATIONS BETWEEN 1-5 MICROGRAMS PER LITER
- [Pattern: Horizontal lines] TCE CONCENTRATIONS BETWEEN 5-10 MICROGRAMS PER LITER
- [Pattern: Vertical lines] TCE CONCENTRATIONS BETWEEN 10-15 MICROGRAMS PER LITER
- [Pattern: Cross-hatch] TCE CONCENTRATIONS BETWEEN 15-20 MICROGRAMS PER LITER
- [Pattern: Stippled] TCE CONCENTRATIONS GREATER THAN 20 MICROGRAMS PER LITER



THE LOWER SUBUNIT  
REGIONAL AQUIFER  
(BER 1996)

2



6 JUNE 1997

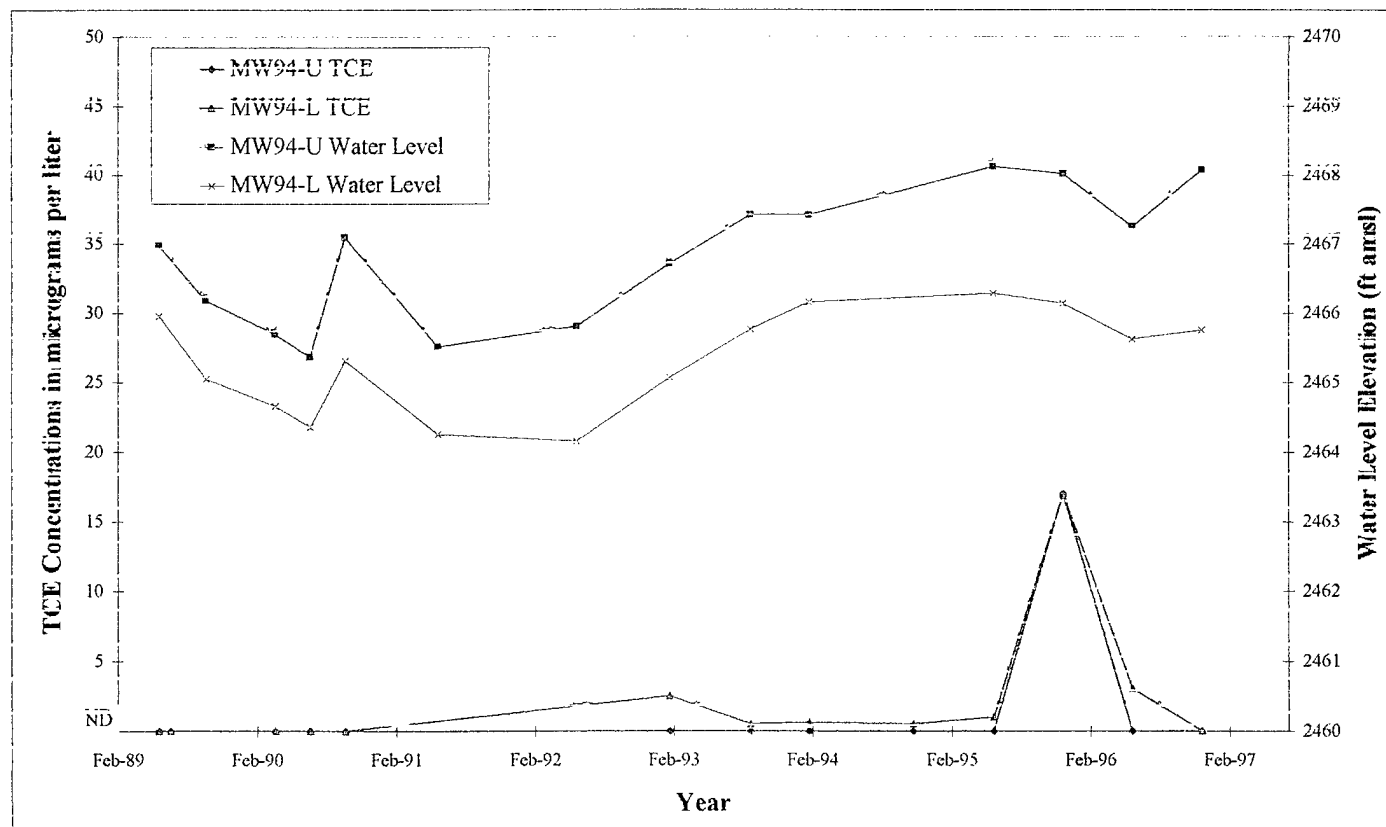
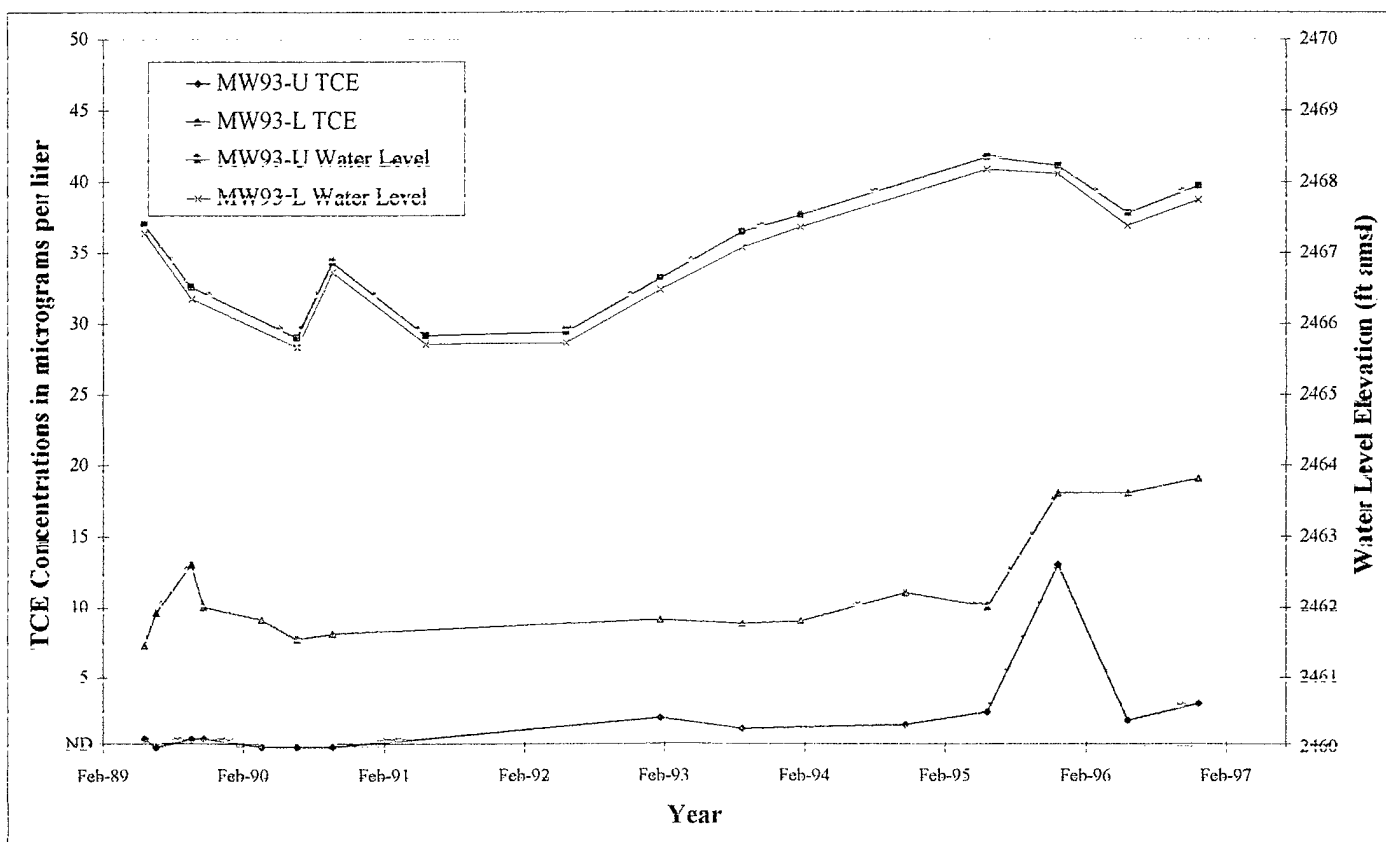


Figure 3-5  
TCE Concentrations and Water Level Hydrographs for Selected Monitor Wells  
Tucson Arizona Air National Guard Base

ND = Not Detected

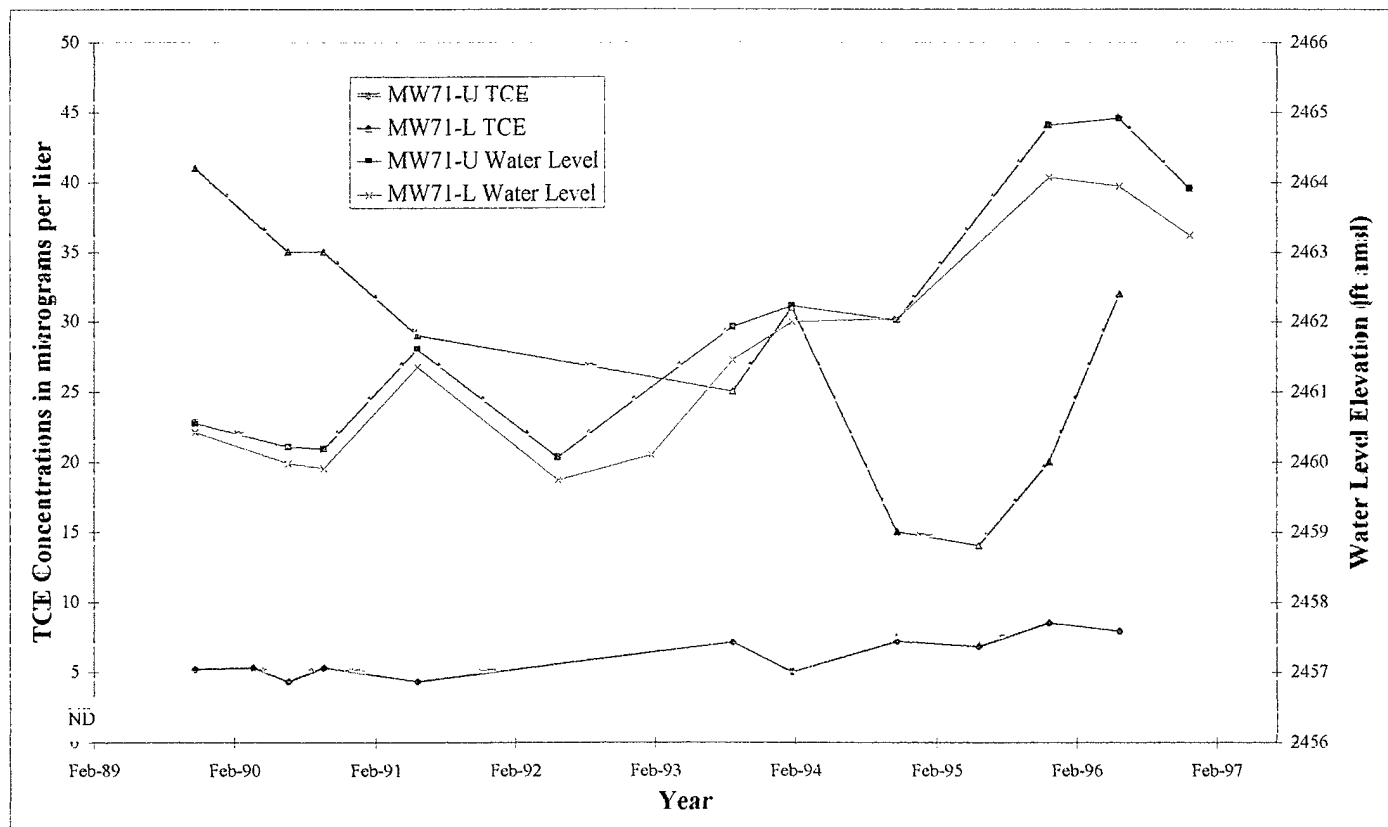
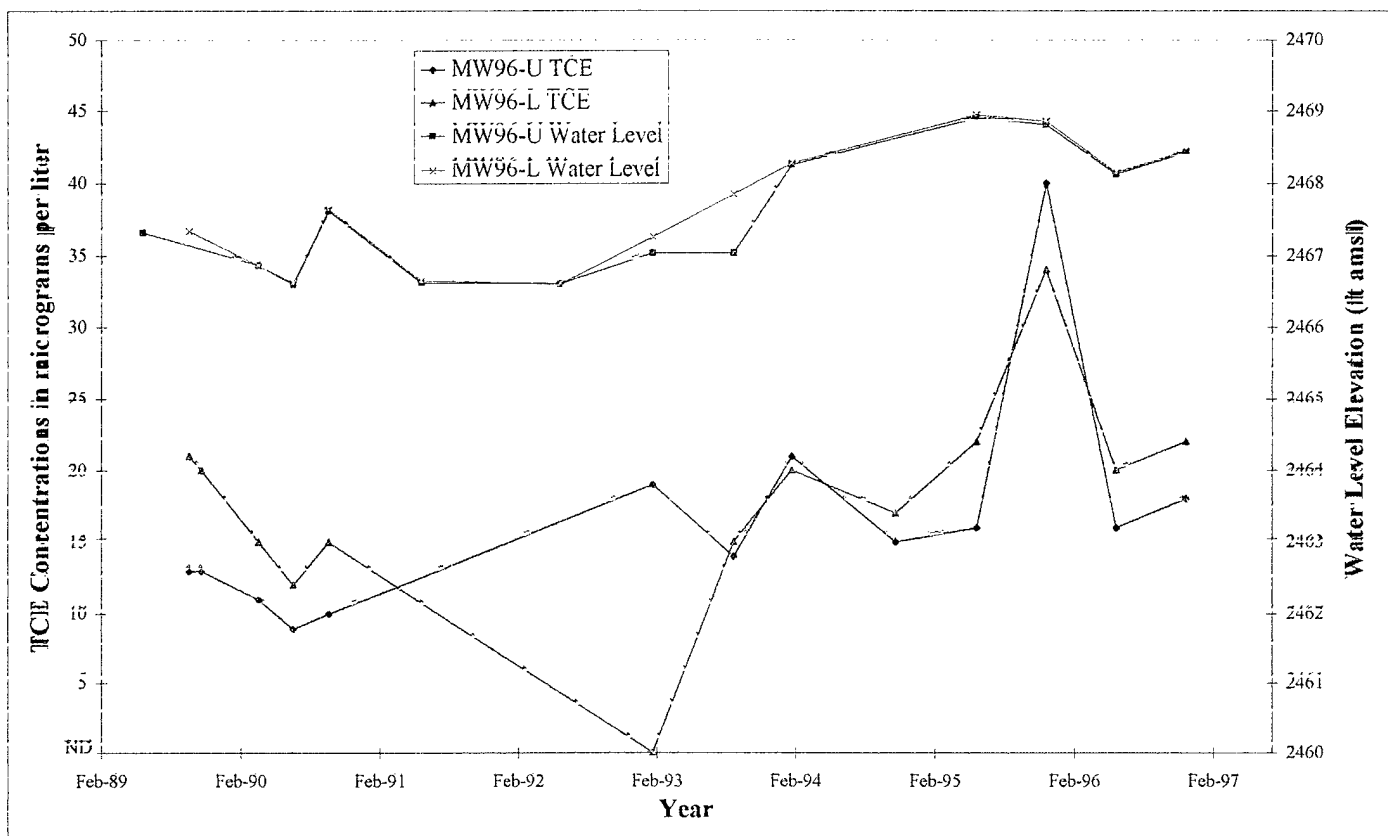


Figure 3.5

TCE Concentrations and Water Level Hydrographs for Selected Monitor Wells  
Tucson Arizona Air National Guard Base

ND = Not Detected

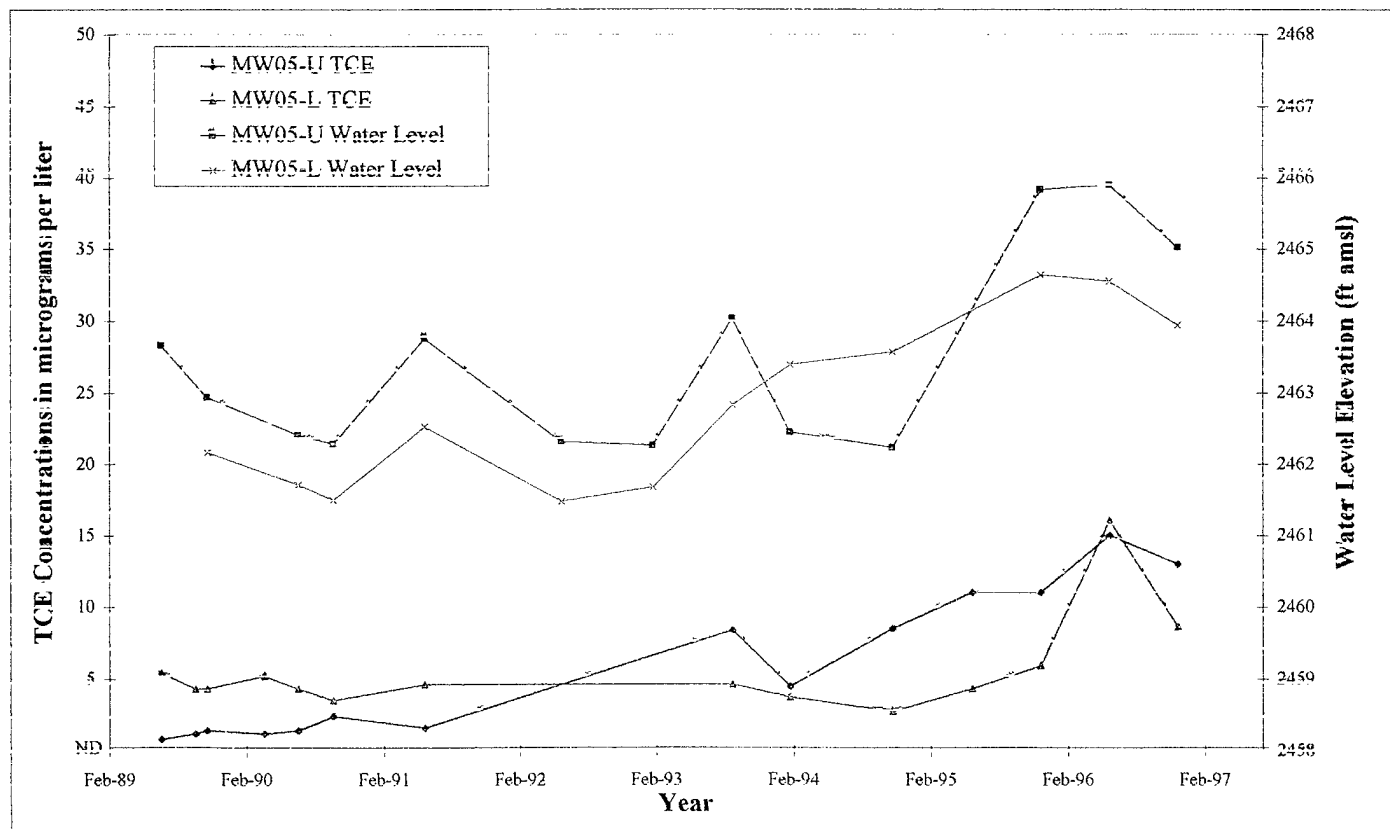
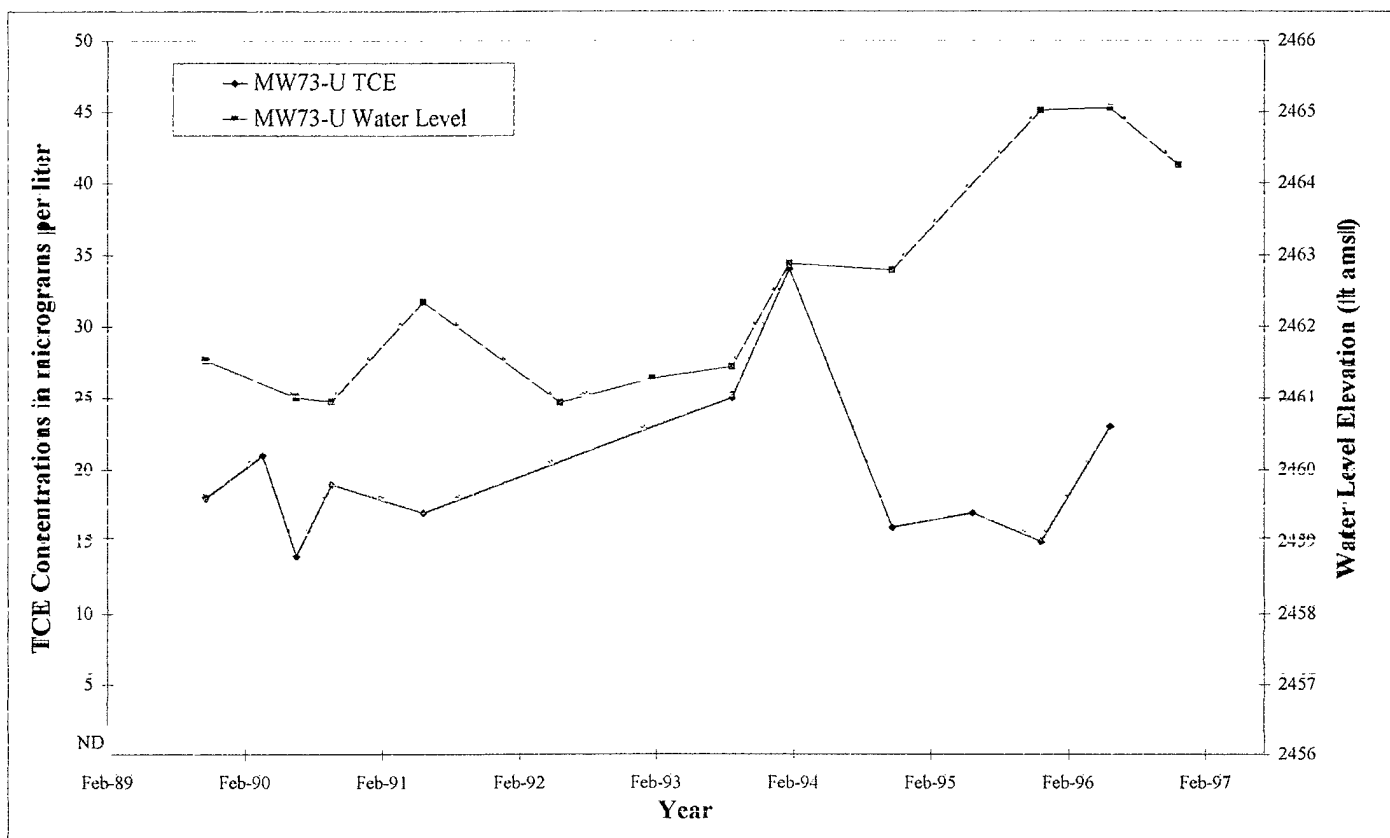


Figure 3-5  
TCE Concentrations and Water Level Hydrographs for Selected Monitor Wells  
Tucson Arizona Air National Guard Base

ND = Not Detected



Laboratory support documentation were reviewed as part of the data validation activities. Support documentation were reviewed for analysis of ground water samples collected from monitoring wells MW03-L, MW03-U, MW71-U, MW71-L, MW04-U, MW42-L, and MW92-L, and the associated trip blank and duplicate sample. All laboratory results were either accepted (unqualified) or qualified. No data reviewed were rejected. Data qualifiers and the data validation report are provided in Appendix B.

### 3.3 February/March Semi-Annual Ground Water Monitoring

The next semi-annual monitoring round is scheduled for late February 1997 and will continue until early March 1997.

## SECTION 4.0

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### REFERENCES

- ERM-West, Inc., (ERM) 1995b, *Final Semi-Annual Ground Water Monitoring Report, 162nd Fighter Group, Arizona Air National Guard, Tucson International Airport, Tucson, Arizona* (September 1995).
- ERM, 1996a, *Final Semi-Annual Ground Water Monitoring Report for the December 1995 Round, 162nd Fighter Group, Arizona Air National Guard, Tucson International Airport, Tucson, Arizona* (May 1996).
- ERM, 1996b, *Final Workplan for Ground Water Monitoring, 162nd Fighter Group, Arizona Air National Guard, Tucson International Airport, Tucson, Arizona* (August 1996).
- ERM, 1996c, *Final Semi-Annual Ground Water Monitoring Report for the June 1996 Round, 162nd Fighter Group, Arizona Air National Guard, Tucson International Airport, Tucson, Arizona* (October 1996).
- Oak Ridge National Laboratory/Environmental Technology Section, (ORNL/ETS) 1995a, *Technical Memorandum, October 1994, Ground Water Sampling Results, Tucson ANG* (February 1995).
- ORNL/ETS, 1995b, *Final Installation Remedial Investigation Report, 162nd Fighter Group, Arizona Air National Guard, Tucson, Arizona* (June 1995).

APPENDIX A

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*ANALYTICAL REPORTS AND  
CHAIN-OF-CUSTODY RECORDS*

Quanterra Incorporated  
1721 South Grand Avenue  
Santa Ana, California 92705

714 258-8610 Telephone  
714 258-0921 Fax



January 16, 1997

ERM-WEST, INC.  
5111 N SCOTTSDALE ROAD, SUITE 108  
SCOTTSDALE, AZ 85250  
ATTN: MS. ROBIN WEESNER

LIMS NO.: 123095-0001/0007  
DATE SAMPLED: 20-NOV-1996  
DATE SAMPLE REC'D: 21-NOV-1996  
PROJECT: 6018.21 / TUCSON ANG

Enclosed with this letter is the report containing the analytical results for the project specified above.

The Narrative section included in the following attachment provides a detailed description of all events that occurred during sample processing, analysis, and data review as applicable to the samples and analytical methods requested.

Report data sheets contain a list of the requested constituents measured in each test, the analytical results, and the standard reporting limits (RLs). Reporting limits are adjusted to reflect any dilution or dry weight correction, when applicable.

Preliminary data were provided on December 20, 1996 at 13:30 to Robin Weesner.

The report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding the data provided in this report, please call Keith Aleckson at (714) 258-8610. Release of this report has been authorized by the Lab Director or the designee as demonstrated by the following signature.

Sincerely,

A handwritten signature in black ink, appearing to read "Keith A. Aleckson".

Keith A. Aleckson  
Project Manager

cc: Project File

**TABLE OF CONTENTS**

**LIMS # 123095**

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LIMS Report Key .....	2
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Narrative .....	4
Chain-of-Custody Records and Sample Description Information	
Analytical Results Summary (LIMS Report)	
A.    LIMS Datasheets	
B.    QC Summaries	

**CASE NARRATIVE**

**LIMS # 123095**

**I. CONDITION UPON RECEIPT**

Cooler was received intact. The temperature of the cooler was 2.4°C.

Sample containers were received intact. The VOA vials did not contain headspace. Sample container labels did agree with the COC as to sample ID, collection date/time, requested tests and preservatives.

**II. ORGANIC ANALYSES (BY METHOD: SW8010)**

Per agreement with ERM-West, the samples were subcontracted to Del Mar Laboratories for analysis.

**HOLDING TIME**

All analyses were performed within method- and project-specific holding times.

**METHOD BLANK**

All method blanks met method- and/or project-specific QC criteria.

**MS/MSD/LCS/DCS AND RPDs**

All spike recovery and RPD data met method- and/or project-specific QC criteria.

**SURROGATE RECOVERIES**

All surrogate spike recoveries in samples and in QC samples met method- and/or project-specific QC criteria.

**CALIBRATIONS**

All calibrations and calibration verifications met method- and/or project-specific QC criteria.

# ERM-West, Inc.

## CHAIN OF CUSTODY RECORD

NO: 1571

123095

Page 1 of 1

455 Capitol Mall, Suite 800 • Sacramento, CA • 95814 • (916) 444-9378 • Fax (916) 444-5313

PROJECT #	PROJECT NAME	# OF CONTAINERS	MATRIX	REQUESTED PARAMETERS										
0018121	TUCSON AVE SEM - ANALYZE GW SAMPLING	3	W. GAS S. OIL	VSIB										
SAMPLER: (PRINT NAME) (SIGNATURE) DAVID S. BETTS David S. Betts														
RECEIVING LABORATORY QUANTERA ENV. SERVICES 92705 1721 S. GARDEN AVE. SANTA ANA, CA. (714) 258-8610														
SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVE	TIME	SAMPLING VOLUME	DATE	TIME	RECEIVED BY	DATE	TIME	FIELD REMARKS
MW72-U-96-2	11/24/96	1125		X	SUB PUMP	HEC	Y	120 ml						
KESLER-1-96-2		1150			HAND									
KESLER-2-96-2		1200												
MW72-L-96-2		1355			SUB PUMP									
MW94-U-96-2		1525												
MW94-L-96-2		1625												
TB112096-1								80 ml						
VSIB														
RELINQUISHED BY (SIGNATURE) DATE TIME														
David S. Betts 11/20/96 1745														
RELINQUISHED BY (SIGNATURE) DATE TIME														
RELINQUISHED BY (SIGNATURE) DATE TIME														
RELINQUISHED BY (SIGNATURE) DATE TIME														
REMARKS ON SAMPLE RECEIPT														
ERM REMARKS														
SEND REPORT TO: M/S. ROBIN WEESENER (SCOTTSDALE OFFICE)														

☐ BOTTLE INTACT ☐ CUSTODY SEALS ☐ CHILLED  
☐ PRESERVED ☐ SEALS INTACT ☐ SEE REMARKS

SAMPLE DESCRIPTION INFORMATION  
for  
ERM-West, Inc.

Lab ID	Client ID	Matrix	Sampled		Received
			Date	Time	
123095-0001-SA	MW72-U-96-2	AQUEOUS	20 NOV 96	11:25	21 NOV 96
123095-0002-SA	KESTLER-1-96-2	AQUEOUS	20 NOV 96	11:50	21 NOV 96
123095-0003-SA	KESTLER-2-96-2	AQUEOUS	20 NOV 96	12:00	21 NOV 96
123095-0004-SA	MW72-L-96-2	AQUEOUS	20 NOV 96	13:55	21 NOV 96
123095-0005-SA	MW94-U-96-2	AQUEOUS	20 NOV 96	15:25	21 NOV 96
123095-0006-SA	MW94-L-96-2	AQUEOUS	20 NOV 96	16:25	21 NOV 96
123095-0007-SA	TB112096-1	WATER-QA	20 NOV 96		21 NOV 96





2852 Alton Ave., Irvine, CA 92714 (714) 261-1022 FAX (714) 261-1211  
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046  
16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1515

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, MW72-U-96-2  
Lab Number: FK03996

Sampled: Nov 20, 1996  
Received: Nov 21, 1996  
Extracted: Dec 2, 1996  
Analyzed: Dec 2, 1996  
Reported: Dec 3, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>4.1</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>3.6</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	109%

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FK03996.QUN <1 of 9>



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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
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Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, Kestler-1-96-2  
Lab Number: FK03997

Sampled: Nov 20, 1996  
Received: Nov 31, 1996  
Extracted: Dec 2, 1996  
Analyzed: Dec 2, 1996  
Reported: Dec 3, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

#### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 104%

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FK03996.QUN <2 of 9>



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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-13

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, Kestler-2-96-2  
Lab Number: FK03998

Sampled: Nov 20, 1996  
Received: Nov 21, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 3, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 104%

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FK03996.QUN <3 of 9>



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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, MW72-L-96-2  
Lab Number: FK03999

Sampled: Nov 20, 1996  
Received: Nov 21, 1996  
Extracted: Dec 2, 1996  
Analyzed: Dec 2, 1996  
Reported: Dec 3, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>3.0</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 100%

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FK03996.QUN <4 of 9>



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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-13

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, MW94-U-96-2  
Lab Number: FK04000

Sampled: Nov 20, 1996  
Received: Nov 21, 1996  
Extracted: Dec 2, 1996  
Analyzed: Dec 2, 1996  
Reported: Dec 3, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>2.1</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	100%

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FK03996.QUN <5 of 9>



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, MW94-L-96-2  
Lab Number: FK04001

Sampled: Nov 20, 1996  
Received: Nov 21, 1996  
Extracted: Dec 2, 1996  
Analyzed: Dec 2, 1996  
Reported: Dec 3, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 100%

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FK03996.QUN <6 of 9>



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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123095  
ERM-West-Tucson/AANG  
Sample Descript: Water, TB112096-1  
Lab Number: FK04002

Sampled: Nov 20, 1996  
Received: Nov 21, 1996  
Extracted: Dec 2, 1996  
Analyzed: Dec 2, 1996  
Reported: Dec 3, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	95%

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FK03996.QUN <7 of 9>

Quanterra Inc.  
 1721 So. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

## Method Blank

Extracted: Dec 2, 1996  
 Analyzed: Dec 2, 1996  
 Reported: Dec 3, 1996  
 Matrix: Water

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	104%

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FK03996.QUN <8 of 9>





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Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

### Method Blank

Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 5, 1996  
Matrix: Water

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	105%

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FK03996.QUN <9 of 9>



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## MS/MSD DATA REPORT

EPA Method 601/602

Matrix: Water

Date: 12/02/96

Sample #: FK03821

Batch #: FL02111W

Analyte	R1	Sp	MS	MSD	PR1	PR2	RPD	Mean PR	Acceptance Limits	
	ppb	ppb	ppb	ppb	%	%	%	%	RPD	Mean PR
Benzene	0	10	9.9	10	99	100	0.16	100	≤10	70 - 130
Chloroform	0.44	10	12	12	115	112	3.2	113	≤25	70 - 130
1,1-Dichloroethane	0	10	11	11	108	108	0.83	108	≤10	70 - 130
1,2-Dichloroethane	0	10	11	12	106	116	8.6	111	≤10	70 - 130
1,1-Dichloroethene	0.087	10	11	11	111	111	0.045	111	≤11	70 - 130
Tetrachloroethene	0.098	10	12	11	117	111	5.5	114	≤10	70 - 130
Toluene	0	10	9.9	10	99	100	1.2	99	≤19	70 - 130
Trichloroethene	0.059	10	12	11	116	110	5.2	113	≤11	70 - 130

### Definition of Terms

- R1..... Result of Sample Analysis  
 Sp..... Spike Concentration added to sample  
 MS..... Matrix Spike Result  
 MSD..... Matrix Spike Duplicate Result  
 PR1..... Percent Recovery of MS;  $((MS-R1)/SP) \times 100$   
 PR2..... Percent Recovery of MSD;  $((MSD-R1)/SP) \times 100$   
 RPD..... Relative Percent Difference;  $((MS-MSD)/(MS+MSD)/2) \times 100$   
 Mean PR..... Mean Percent Recovery  
 Acceptance Limits..... Determined by in-house Control Charts

Del Mar Analytical

## LCS DATA REPORT

**EPA Method 601/602**

Matrix: Water

**Date:** 12/02/96

**Batch #:** FL02111W

<u>Analyte</u>	<u>Spike Conc.</u>	<u>Result</u>	<u>% Recovery</u>	<u>ACP</u>
Benzene	10	9.9	99	80 - 120 %
Chloroform	10	11	113	80 - 120 %
1,1-Dichloroethane	10	10	105	80 - 120 %
1,2-Dichloroethane	10	12	115	80 - 120 %
1,1-Dichloroethene	10	10	100	80 - 120 %
Tetrachloroethene	10	9.8	98	80 - 120 %
Toluene	10	9.7	97	80 - 120 %
Trichloroethene	10	10	102	80 - 120 %

### Definition of Terms

**LCS** ..... Laboratory Control Sample

**Spike Conc** ..... Result of Sample Analysis

**Result** ..... Result of Laboratory Control Sample Analysis

**%Recovery** ..... Percent Recovery of LCS; ((Result - Spike Conc.) / Spike Conc.) X 100

**ACP** ..... Acceptance Limits for Percent Recovery

**Del Mar Analytical**

Quanterra Incorporated  
1721 South Grand Avenue  
Santa Ana, California 92705

714 258-8610 Telephone  
714 258-0921 Fax

**RECEIVED**

FEB 12 1997

**ERM-WEST INC.  
PHOENIX, AZ.**

February 4, 1997

ERM-WEST, INC.  
5111 N SCOTTSDALE ROAD, SUITE 108  
SCOTTSDALE, AZ 85250  
ATTN: MS. ROBIN WEESNER

LIMS NO.: 123137-0001/0009  
DATE SAMPLED: 21-NOV-1996  
DATE SAMPLE REC'D: 22-NOV-1996  
PROJECT: 6018.21 / TUCSON ANG

Enclosed with this letter is an AMENDED report containing the analytical results for the project specified above.

The Narrative section included in the following attachment provides a detailed description of all events that occurred during sample processing, analysis, and data review as applicable to the samples and analytical methods requested.

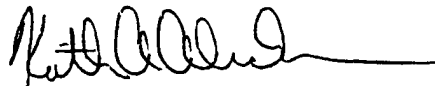
Report data sheets contain a list of the requested constituents measured in each test, the analytical results, and the standard reporting limits (RLs). Reporting limits are adjusted to reflect any dilution or dry weight correction, when applicable. Also provided in this report are the LIMS Report Key and the terms and abbreviations commonly used in our reports.

Preliminary data were provided on December 20, 1996 at 13:35 to Robin Weesner.

The report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding the data provided in this report, please call Keith Aleckson at (714) 258-8610. Release of this report has been authorized by the Lab Director or the designee as demonstrated by the following signature.

Sincerely,



Keith A. Aleckson  
Project Manager

cc: Project File

LIMS REPORT KEY



Environmental  
Services

Section	Description
Cover letter	Signature page, report narrative as applicable.
Sample Description Information	Tabulated cross-reference between the Lab ID and Client ID, including matrix, date and time sampled and the date received for all samples in the project.
Sample Analysis Results Sheets	Lists sample results, test components, reporting limits, dates prepared and analyzed and any data qualifiers. Pages are organized by test.
QC Lot Assignment Report	Cross-reference between lab IDs and applicable QC batches (DCS, LCS, SCS, Blank, MS/SD, DU)
Duplicate Control Sample Report	Percent recovery and RPD results, with acceptance limits, for the laboratory Duplicate Control Samples for each test are tabulated in this report. These are measures of accuracy and precision for each test.
Laboratory Control Sample Report	Percent recovery results for a single Laboratory Control Sample (if applicable) are tabulated in this report, with the applicable acceptance limits for each test.
Matrix Spike/Matrix Spike Duplicate Report	Percent recovery and RPD results for matrix-specific QC samples and acceptance limits, where applicable. This report can be used to assess matrix effects on an analysis.
Single Control Sample Report	A tabulation of the surrogate recoveries for the blank for organic analyses.
Method Blank Report	A summary of the results of the analysis of the method blank for each test.

List of Abbreviations and Terms

DCS	Duplicate Control Sample	MSD	Matrix Spike Duplicate
DU	Sample Duplicate	QC Run	Preparation batch
EB	Equipment Blank	QC Category	LIMS QC Category
FB	Field Blank	QC Lot	DCS batch
FD	Field Duplicate	ND	Not Detected at the reporting limit expressed
IDL	Instrument Detection Limit	QC Matrix	Matrix of the laboratory control sample (s)
LCS	Laboratory Control Sample	RL	Reporting Limit
MB	Method Blank	QC	Quality Control
MDL	Method Detection Limit	SA	Sample
MS	Matrix Spike	SD	See MSD
RPD	Relative Percent Difference	TB	Trip Blank
ppm (parts-per-million)	mg/L or mg/kg	ppb (parts-per-billion)	µg/L or µg/kg
QUAL	Qualifier flag	DIL	Dilution Factor

Refer to the Quanterra Incorporated Quality Assurance Management Plan for detailed explanations of terms summarized above.

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**LIMS # 123137**

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**CASE NARRATIVE**

**LIMS # 123137**

**AMENDMENT**

**Amendment 1:** The report is amended to provide an initial calibration summary, the initial calibration data, and the mid-point calibration check for this project. The summary was requested in a conversation with ERM-West on February 3, 1997. The initial calibration and mid-point data were inadvertently omitted from the original submission of the report. The omission was identified by ERM-West on January 30, 1997.

**I. CONDITION UPON RECEIPT**

Cooler was received intact. The temperature of the cooler was 2.4°C. The temperature blank was measured at 2.5°C.

Sample containers were received intact. The VOA vials did not contain headspace. Sample container labels did agree with the COC as to sample ID, collection date/time, requested tests and preservatives.

**II. ORGANIC ANALYSES (BY METHOD: SW8010)**

Per agreement with ERM-West, the samples were subcontracted to Del Mar Laboratories for analysis. Supporting data are provided to meet the 10% full documentation requirement.

**HOLDING TIME**

All analyses were performed within method- and/or project specific criteria.

**METHOD BLANK**

All method blanks met method- and/or project-specific QC criteria.

**MS/MSD/LCS/DCS AND RPDs**

All spike recovery and RPD data met method- and/or project-specific QC criteria.

**SURROGATE RECOVERIES**

All surrogate spike recoveries in samples and in QC samples met method- and/or project-specific QC criteria.

**CALIBRATIONS**

All calibrations and calibration verifications met method- and/or project-specific QC criteria.

SAMPLE DESCRIPTION INFORMATION  
for  
ERM-West, Inc.

Lab ID	Client ID	Matrix	Sampled		Received
			Date	Time	
123137-0001-SA	TB112196-1	AQUEOUS	21 NOV 96		22 NOV 96
123137-0002-SA	MW03-L-96-2	AQUEOUS	21 NOV 96	08:55	22 NOV 96
123137-0003-SA	MW03-U-96-2	AQUEOUS	21 NOV 96	09:30	22 NOV 96
123137-0004-SA	MW71-U-96-2	AQUEOUS	21 NOV 96	11:40	22 NOV 96
123137-0005-SA	MW71-L-96-2	AQUEOUS	21 NOV 96	12:22	22 NOV 96
123137-0006-SA	MW04-U-96-2	AQUEOUS	21 NOV 96	14:22	22 NOV 96
123137-0007-SA	MW42-L-96-2	AQUEOUS	21 NOV 96	15:50	22 NOV 96
123137-0008-SA	MW92-U-96-2	AQUEOUS	21 NOV 96	17:10	22 NOV 96
123137-0009-SA	MW71-L-96-2*	AQUEOUS	21 NOV 96	12:22	22 NOV 96





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2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, TB112196-1 (-001)  
Lab Number: FK04036

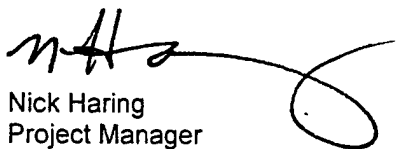
Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene.....	104%
-------------------------------	------

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FK04036.QUN <1 of 10>



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Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW03-L-96-2 (-002)  
Lab Number: FK04037

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>1.8</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 104%

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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW03-U-96-2 (03)  
Lab Number: FK04038

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	99%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1339

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW71-U-96-2 (-004)  
Lab Number: FK04039

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>2.8</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>9.3</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	102%

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FK04036.QUN <4 of 10>



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW71-L-96-2 (-05)  
Lab Number: FK04040

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>14</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 98%

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FK04036.QUN <5 of 10>



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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW04-U-96-2 (-006)  
Lab Number: FK04041

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>2.2</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>11</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 103%

Results pertain only to samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

FK04036.QUN <6 of 10>

Quanterra Inc.  
 1721 So. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123137  
 ERM-West  
 Sample Descript: Water, MW42-L-96-2 (-007)  
 Lab Number: FK04042

Sampled: Nov 21, 1996  
 Received: Nov 22, 1996  
 Extracted: Dec 3, 1996  
 Analyzed: Dec 3, 1996  
 Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>16</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	102%

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 16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
 1721 So. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123137  
 ERM-West  
 Sample Descript: Water, MW92-U-96-2 (-008)  
 Lab Number: FK04043

Sampled: Nov 21, 1996  
 Received: Nov 22, 1996  
 Extracted: Dec 3, 1996  
 Analyzed: Dec 3, 1996  
 Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>9.8</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	97%

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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW71-L-96-2 (-009)  
Lab Number: FK04044

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>12</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	97%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1847  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

### Method Blank

Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996  
Matrix: Water

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit		Sample Result	
	µg/L	(ppb)	µg/L	(ppb)
Bromodichloromethane.....	1.0		N.D.	
Bromoform.....	1.0		N.D.	
Bromomethane.....	1.0		N.D.	
Carbon tetrachloride.....	1.0		N.D.	
Chlorobenzene.....	1.0		N.D.	
Chloroethane.....	1.0		N.D.	
2-Chloroethylvinyl ether.....	1.0		N.D.	
Chloroform.....	1.0		N.D.	
Chloromethane.....	1.0		N.D.	
Dibromochloromethane.....	1.0		N.D.	
1,2-Dichlorobenzene.....	1.0		N.D.	
1,3-Dichlorobenzene.....	1.0		N.D.	
1,4-Dichlorobenzene.....	1.0		N.D.	
1,1-Dichloroethane.....	1.0		N.D.	
1,2-Dichloroethane.....	1.0		N.D.	
1,1-Dichloroethene.....	1.0		N.D.	
cis-1,2-Dichloroethene.....	1.0		N.D.	
trans-1,2-Dichloroethene.....	1.0		N.D.	
1,2-Dichloropropane.....	1.0		N.D.	
cis-1,3-Dichloropropene.....	1.0		N.D.	
trans-1,3-Dichloropropene.....	1.0		N.D.	
Methylene chloride.....	1.0		N.D.	
1,1,2,2-Tetrachloroethane.....	1.0		N.D.	
Tetrachloroethene.....	1.0		N.D.	
1,1,1-Trichloroethane.....	1.0		N.D.	
1,1,2-Trichloroethane.....	1.0		N.D.	
Trichloroethene.....	1.0		N.D.	
Trichlorofluoromethane.....	1.0		N.D.	
Vinyl chloride.....	1.0		N.D.	
Dichlorodifluoromethane.....	5.0		N.D.	

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	105%

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FK04036.QUN <10 of 10>

## MS/MSD DATA REPORT

**EPA Method 601/602**

Matrix: Water

**Date:** 12/03/96

**Sample #:** FK04036

**Batch #:** FL03111W

<u>Analyte</u>	<u>R1</u>	<u>Sp</u>	<u>MS</u>	<u>MSD</u>	<u>PR1</u>	<u>PR2</u>	<u>RPD</u>	<u>Mean PR</u>	<u>Acceptance Limits</u>	
	ppb	ppb	ppb	ppb	%	%	%	%	<u>RPD</u>	<u>Mean PR</u>
Benzene	0	10	9.9	10	99	102	2.4	101	≤ 10	70 - 130
Chloroform	0	10	10	11	102	109	6.0	105	≤ 25	70 - 130
1,1-Dichloroethane	0	10	10	10	101	102	1.5	102	≤ 10	70 - 130
1,2-Dichloroethane	0	10	10	11	104	106	2.6	105	≤ 10	70 - 130
1,1-Dichloroethene	0.12	10	11	11	114	104	8.5	109	≤ 11	70 - 130
Tetrachloroethene	0.040	10	11	11	106	108	2.5	107	≤ 10	70 - 130
Toluene	0	10	9.9	10	99	101	2.0	100	≤ 19	70 - 130
Trichloroethene	0.054	10	9.5	10	95	104	9.7	99	≤ 11	70 - 130

### Definition of Terms

R1..... Result of Sample Analysis  
Sp..... Spike Concentration added to sample  
MS..... Matrix Spike Result  
MSD..... Matrix Spike Duplicate Result  
PR1..... Percent Recovery of MS; ((MS-R1)/SP) X 100  
PR2..... Percent Recovery of MSD; ((MSD-R1)/SP) X 100  
RPD..... Relative Percent Difference; ((MS-MSD)/(MS+MSD)/2) X 100  
Mean PR..... Mean Percent Recovery  
Acceptance Limits ..... Determined by in-house Control Charts

## LCS DATA REPORT

**EPA Method 601/602**

Matrix: Water

Date: 12/03/96

Batch #: FL03111W

<u>Analyte</u>	<u>Spike Conc.</u>	<u>Result</u>	<u>% Recovery</u>	<u>ACP</u>
Benzene	10	10	102	80 - 120 %
Chloroform	10	11	113	80 - 120 %
1,1-Dichloroethane	10	10	105	80 - 120 %
1,2-Dichloroethane	10	12	118	80 - 120 %
1,1-Dichloroethene	10	11	106	80 - 120 %
Tetrachloroethene	10	10	100	80 - 120 %
Toluene	10	10	100	80 - 120 %
Trichloroethene	10	10	105	80 - 120 %

### Definition of Terms

LCS ..... Laboratory Control Sample

Spike Conc ..... Result of Sample Analysis

Result ..... Result of Laboratory Control Sample Analysis

%Recovery ..... Percent Recovery of LCS; ((Result - Spike Conc.) / Spike Conc.) X 100

ACP ..... Acceptance Limits for Percent Recovery

**Del Mar Analytical**

# ERM-West, Inc.


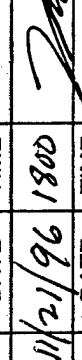



## CHAIN OF CUSTODY RECORD

455 Capitol Mall, Suite 800 • Sacramento, CA • 95814 • (916) 444-9378 • Fax (916) 444-5313

NO: 1578

123137

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PROJECT #	PROJECT NAME	MATRIX	REQUESTED PARAMETERS											
6018.21	TUCSON AWA	W. GAS	<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 100px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">EPA METHOD 8108</div> <div style="font-size: 40px; font-weight: bold;">058</div> </div>											
SAMPLER: (PRINT NAME)		SOIL												
DAVID S. BETTS		CONTAINERS												
RECEIVING LABORATORY														
QUANTERA ENV. SERVICES														
1721 S. GRANO AVE.														
SANTA ANA, CA. (714) 258-8610														
SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVE NATIVE	(%)	SAMPLING VOLUME	RECEIVED BY	DATE	TIME	FIELD REMARKS		
TS112196-1	11/21/96	—			—	HCL	Y	80ml						
MW03-L-96-2		0855		X	SUB. pump			120ml						
MW03-U-96-2		0930												
MW71-U-96-2		1140												
MW71-L-96-2		1222												
MW04-U-96-2		1422												
MW42-L-96-2		1550												
MW92-U-96-2		1710												
MW71-L-96-2		1222												
<div style="border: 1px solid black; border-radius: 50%; width: 100px; height: 100px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">EPA METHOD 8108</div> <div style="font-size: 40px; font-weight: bold;">058</div> </div>														
RELINQUISHED BY (SIGNATURE)												DATE	TIME	FIELD REMARKS
												11/21/96	1800	
RELINQUISHED BY (SIGNATURE)												DATE	TIME	
														
RELINQUISHED BY (SIGNATURE)												DATE	TIME	
														
RELINQUISHED BY (SIGNATURE)												DATE	TIME	
														
RELINQUISHED BY (SIGNATURE)												DATE	TIME	
														
REMARKS ON SAMPLE RECEIPT												ERM REMARKS		SEND REPORT TO:
<input type="checkbox"/> BOTTLE INTACT <input type="checkbox"/> CUSTODY SEALS <input type="checkbox"/> CHILLED <input type="checkbox"/> PRESERVED <input type="checkbox"/> SEALS INTACT <input type="checkbox"/> SEE REMARKS														MS. ROBIN WEESNER (SCOTTSDALE OFFICE)

Quanterra Incorporated  
1721 South Grand Avenue  
Santa Ana, California 92705

714 258-8610 Telephone  
714 258-0921 Fax



January 16, 1997

ERM-WEST, INC.  
5111 N SCOTTSDALE ROAD, SUITE 108  
SCOTTSDALE, AZ 85250  
ATTN: MS. ROBIN WEESNER

LIMS NO.: 123170-0001/0006  
DATE SAMPLED: 22-NOV-1996  
DATE SAMPLE REC'D: 23-NOV-1996  
PROJECT: 6018.21 / TUCSON ANG

Enclosed with this letter is the report containing the analytical results for the project specified above.

The Narrative section included in the following attachment provides a detailed description of all events that occurred during sample processing, analysis, and data review as applicable to the samples and analytical methods requested.

Report data sheets contain a list of the requested constituents measured in each test, the analytical results, and the standard reporting limits (RLs). Reporting limits are adjusted to reflect any dilution or dry weight correction, when applicable.

Preliminary data were provided on December 13, 1996 at 16:15 to Robin Weesner.

The report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding the data provided in this report, please call Keith Aleckson at (714) 258-8610. Release of this report has been authorized by the Lab Director or the designee as demonstrated by the following signature.

Sincerely,

A handwritten signature in black ink, appearing to read "Keith Aleckson". The signature is fluid and cursive, with a long horizontal line extending to the right.

Keith A. Aleckson  
Project Manager

cc: Project File



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LIMS # 123170

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Narrative ..... 4

Chain-of-Custody Records and Sample Description Information

Analytical Results Summary (LIMS Report)

A. LIMS Datasheets

B. QC Summaries

**CASE NARRATIVE**

**LIMS # 123170**

**I. CONDITION UPON RECEIPT**

Cooler was received intact. The temperature of the cooler was 2.9°C.

Sample containers were received intact. The VOA vials did not contain headspace. Sample container labels did agree with the COC as to sample ID, collection date/time, requested tests and preservatives.

**II. ORGANIC ANALYSES (BY METHOD: SW8010)**

Per agreement with ERM-West, the samples were subcontracted to Del Mar Laboratories for analysis.

**HOLDING TIME**

All analyses were performed within method- and project-specific holding times.

**METHOD BLANK**

All method blanks met method- and/or project-specific QC criteria.

**MS/MSD/LCS/DCS AND RPDs**

All spike recovery and RPD data met method- and/or project-specific QC criteria.

**SURROGATE RECOVERIES**

All surrogate spike recoveries in samples and in QC samples met method- and/or project-specific QC criteria.

**CALIBRATIONS**

All calibrations and calibration verifications met method- and/or project-specific QC criteria.



# ERM-West, Inc.

## CHAIN OF CUSTODY RECORD

455 Capitol Mall, Suite 800 • Sacramento, CA • 95814 • (916) 444-9378 • Fax (916) 444-5313

NO: 1579

Page 1 of 1

PROJECT #		PROJECT NAME		# OF CONTAINERS		MATRIX		REQUESTED PARAMETERS	
6018.21		TUCSON AVG							
SAMPLER: (PRINT NAME)		(SIGNATURE)							
DAVID S. BETTS		David S. Betts							
RECEIVING LABORATORY									
QUANTEREA ANALYTICAL									
1721 S. GRAND AVE.									
SANTA ANA, CA. (714) 258-8610									
SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	CF	SAMPLING VOLUME	
TB112296-1	11/22/96	—			—	HCL	Y	80ml	X
MW73-U-96-2		0928		X	SUB. pump			120ml	X
MW74-L-96-2		1037							X
MW74-U-96-2		1133							X
MW05-L-96-2		1440							X
MW05-U-96-2		1555							X
(Signature)									
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME	FIELD REMARKS	
David S. Betts		11/22/96	1000			11/23/96	1030		
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME		
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME		
REMARKS ON SAMPLE RECEIPT		ERM REMARKS							
<input type="checkbox"/> BOTTLE INTACT <input type="checkbox"/> CUSTODY SEALS <input type="checkbox"/> CHILLED <input type="checkbox"/> PRESERVED <input type="checkbox"/> SEALS INTACT <input type="checkbox"/> SEE REMARKS									
SEND REPORT TO:		MS. ROBIN WEEBING (SCOTSDALE OFFICE)							



Environmental  
Services

SAMPLE DESCRIPTION INFORMATION  
for  
ERM-West, Inc.

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
123170-0001-SA	TB112296-1	WATER-QA	22 NOV 96		23 NOV 96
123170-0002-SA	MW73-U-96-2	AQUEOUS	22 NOV 96	09:28	23 NOV 96
123170-0003-SA	MW74-L-96-2	AQUEOUS	22 NOV 96	10:37	23 NOV 96
123170-0004-SA	MW74-U-96-2	AQUEOUS	22 NOV 96	11:33	23 NOV 96
123170-0005-SA	MW05-L-96-2	AQUEOUS	22 NOV 96	14:40	23 NOV 96
123170-0006-SA	MW05-U-96-2	AQUEOUS	22 NOV 96	15:50	23 NOV 96



# Del Mar Analytical

2852 Alton Ave., Irvine, CA 92714

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(818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123170  
ERM-West/Tucson Ang.  
Sample Descript: Water, TB112296-1  
Lab Number: FK04362

Sampled: Nov 22, 1996  
Received: Nov 25, 1996  
Extracted: Dec 5, 1996  
Analyzed: Dec 5, 1996  
Reported: Dec 6, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 103%

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FK04362.QUN <1 of 7>



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1312

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123170  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW73-U-96-2  
Lab Number: FK04363

Sampled: Nov 22, 1996  
Received: Nov 25, 1996  
Extracted: Dec 5, 1996  
Analyzed: Dec 5, 1996  
Reported: Dec 6, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>14</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	102%

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FK04362.QUN <2 of 7>



# Del Mar Analytical

2852 Alton Ave., Irvine, CA 92714 (714) 261-1022 FAX (714) 261-1228  
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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123170  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW74-L-96-2  
Lab Number: FK04364

Sampled: Nov 22, 1996  
Received: Nov 25, 1996  
Extracted: Dec 5, 1996  
Analyzed: Dec 5, 1996  
Reported: Dec 6, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>15</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 101%

Results pertain only to samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

FK04362.QUN <3 of 7>



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123170  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW74-U-96-2  
Lab Number: FK04365

Sampled: Nov 22, 1996  
Received: Nov 25, 1996  
Extracted: Dec 5, 1996  
Analyzed: Dec 5, 1996  
Reported: Dec 6, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>3.9</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	100%

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FK04362.QUN <4 of 7>

Quanterra Inc.  
 1721 So. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123170  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW05-L-96-2  
 Lab Number: FK04366

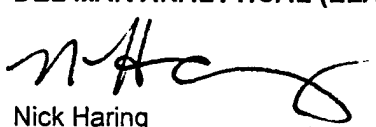
Sampled: Nov 22, 1996  
 Received: Nov 25, 1996  
 Extracted: Dec 5, 1996  
 Analyzed: Dec 5, 1996  
 Reported: Dec 6, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>7.8</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
 Nick Haring  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	99%

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FK04362.QUN <5 of 7>



# Del Mar Analytical

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Quanterra Inc.  
 1721 So. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123170  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW05-U-96-2  
 Lab Number: FK04367

Sampled: Nov 22, 1996  
 Received: Nov 25, 1996  
 Extracted: Dec 5, 1996  
 Analyzed: Dec 5, 1996  
 Reported: Dec 6, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>9.9</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	100%

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FK04362.QUN <6 of 7>





# Del Mar Analytical

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(818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

## Method Blank

Extracted: Dec 5, 1996  
Analyzed: Dec 5, 1996  
Reported: Dec 6, 1996  
Matrix: Water

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

#### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 106%

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FK04362.QUN <7 of 7>

## LCS DATA REPORT

**EPA Method 601/602**

Matrix: Water

**Date:** 12/05/96

**Batch #:** FL05111W

<u>Analyte</u>	<u>Spike Conc.</u>	<u>Result</u>	<u>% Recovery</u>	<u>ACP</u>
Benzene	10	10	102	80 - 120 %
Chloroform	10	11	108	80 - 120 %
1,1-Dichloroethane	10	9.4	94	80 - 120 %
1,2-Dichloroethane	10	11	115	80 - 120 %
1,1-Dichloroethene	10	9.0	90	80 - 120 %
Tetrachloroethene	10	9.8	98	80 - 120 %
Toluene	10	9.9	99	80 - 120 %
Trichloroethene	10	10	104	80 - 120 %

### Definition of Terms

**LCS** ..... Laboratory Control Sample  
**Spike Conc** ..... Result of Sample Analysis  
**Result** ..... Result of Laboratory Control Sample Analysis  
**%Recovery** ..... Percent Recovery of LCS; ((Result - Spike Conc.) / Spike Conc.) X 100  
**ACP** ..... Acceptance Limits for Percent Recovery

**Del Mar Analytical**



## MS/MSD DATA REPORT

EPA Method 601/602

Matrix: Water

Date: 12/05/96

Sample #: FL00165

Batch #: FL05111W

Analyte	R1	Sp	MS	MSD	PR1	PR2	RPD	Mean PR	Acceptance Limits	
	ppb	ppb	ppb	ppb	%	%	%	%	RPD	Mean PR
Benzene	0	10	10	10	104	103	0.95	104	≤10	70 - 130
Chloroform	0	10	12	13	120	125	4.0	123	≤25	70 - 130
1,1-Dichloroethane	0	10	10	10	103	101	1.4	102	≤10	70 - 130
1,2-Dichloroethane	0	10	12	12	119	118	0.72	119	≤10	70 - 130
1,1-Dichloroethene	0	10	9.8	9.7	98	97	1.1	97	≤11	70 - 130
Tetrachloroethene	0	10	10	10	103	102	0.43	102	≤10	70 - 130
Toluene	0	10	10	10	102	101	0.99	102	≤19	70 - 130
Trichloroethene	0	10	11	10	110	104	5.2	107	≤11	70 - 130

### Definition of Terms

- R1..... Result of Sample Analysis  
Sp..... Spike Concentration added to sample  
MS..... Matrix Spike Result  
MSD..... Matrix Spike Duplicate Result  
PR1..... Percent Recovery of MS;  $((MS-R1)/SP) \times 100$   
PR2..... Percent Recovery of MSD;  $((MSD-R1)/SP) \times 100$   
RPD..... Relative Percent Difference;  $((MS-MSD)/(MS+MSD)/2) \times 100$   
Mean PR..... Mean Percent Recovery  
Acceptance Limits..... Determined by in-house Control Charts



Quanterra Incorporated  
1721 South Grand Avenue  
Santa Ana, California 92705

714 258-8610 Telephone  
714 258-0921 Fax



January 16, 1997

ERM-WEST, INC.  
5111 N SCOTTSDALE ROAD, SUITE 108  
SCOTTSDALE, AZ 85250  
ATTN: MS. ROBIN WEESNER

LIMS NO.: 123313-0001/0019  
DATE SAMPLED: 02/03-DEC-1996  
DATE SAMPLE REC'D: 04-DEC-1996  
PROJECT: 6018.21 / TUCSON ANG

Enclosed with this letter is the report containing the analytical results for the project specified above.

The Narrative section included in the following attachment provides a detailed description of all events that occurred during sample processing, analysis, and data review as applicable to the samples and analytical methods requested.

Report data sheets contain a list of the requested constituents measured in each test, the analytical results, and the standard reporting limits (RLs). Reporting limits are adjusted to reflect any dilution or dry weight correction, when applicable.

Preliminary data were provided on December 19, 1996 at 13:28 to Robin Weesner.

The report shall not be reproduced except in full, without the written approval of the laboratory.

If you have any questions regarding the data provided in this report, please call Keith Aleckson at (714) 258-8610. Release of this report has been authorized by the Lab Director or the designee as demonstrated by the following signature.

Sincerely,

A handwritten signature in black ink, appearing to read "Keith Aleckson".

Keith A. Aleckson  
Project Manager

cc: Project File

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**LIMS # 123313**

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**CASE NARRATIVE**

**LIMS # 123313**

**I. CONDITION UPON RECEIPT**

Cooler was received intact. The temperature of the cooler was 2.4°C. The temperature blank was measured at 2.6°C.

Sample containers were received intact. The VOA vials did not contain headspace. Sample container labels did agree with the COC as to sample ID, collection date/time, requested tests and preservatives.

**II. ORGANIC ANALYSES (BY METHOD: SW8010)**

Per agreement with ERM-West, the samples were subcontracted to Del Mar Laboratories for analysis.

**HOLDING TIME**

All analyses were performed within method- and project-specific holding times, with the following exceptions: MW93-L-96-2, MW96-U-96-2, MW96-U-96-2\*, MW96-L-96-2, MW97-U-96-2, MW97-L-96-2, MW97-L-96-2\*, and TB120296-1. The holding times were missed by one day. Per our discussion with ERM-West, the results are reported. There is no charge for the analyses outside of holding time.

**METHOD BLANK**

All method blanks met method- and/or project-specific QC criteria.

**MS/MSD/LCS/DCS AND RPDs**

All spike recovery and RPD data met method- and/or project-specific QC criteria.

**SURROGATE RECOVERIES**

All surrogate spike recoveries in samples and in QC samples met method- and/or project-specific QC criteria.

**CALIBRATIONS**

All calibrations and calibration verifications met method- and/or project-specific QC criteria.

# ERM-West, Inc.

## CHAIN OF CUSTODY RECORD

NO: 1580

123313

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Page 1 of 2

PROJECT #		PROJECT NAME		# OF CONTAINERS		MATRIX		REQUESTED PARAMETERS									
PROJECT #		PROJECT NAME		# OF CONTAINERS		MATRIX		REQUESTED PARAMETERS									
6018.21		TUCSON AND SEMI ANNUAL GROUNDWATER		2		WATER		MS/MSD									
FRANK LAMPHIERE		(SIGNATURE)		3		SOIL		8010 UCCs									
RECEIVING LABORATORY		(SIGNATURE)		3		GAS											
1721 S. QUANTERRA		(SIGNATURE)		9													
SANTA ANA AVE		(SIGNATURE)		3													
710-258-8610		(SIGNATURE)		3													
SAMPLE I.D.	DATE	TIME	COM	GRAB	SAMPLING METHOD	ANALYSIS	SAMPLING VOLUME	DATE	TIME	RECEIVED BY	DATE	TIME	FIELD REMARKS				
TJ120296-1	12-2-96	---			LAD	HCL	80mL										
MW93-L-96-2	12-2-96	17:10		X	SUB PUMP	HCL	120mL										
MW96-U-96-2	12-2-96	18:40		X	SUB PUMP	HCL	120mL										
MW96-U-96-2*	12-2-96	18:41		X	SUB PUMP	HCL	120mL										
MW96-L-96-2	12-2-96	19:10		X	SUB PUMP	HCL	360mL										
MW97-U-96-2	12-2-96	20:45		X	SUB PUMP	HCL	120mL										
MW97-L-96-2	12-2-96	21:15		X	SUB PUMP	HCL	120mL										
MW97-L-96-2*	12-2-96	21:15		X	SUB PUMP	HCL	120mL										
MW93-U-96-2	12-3-96	08:10		X	SUB PUMP	HCL	120mL										
MW93-U-96-2*	12-3-96	08:11		X	SUB PUMP	HCL	120mL										
RELINQUISHED BY (SIGNATURE)		DATE		TIME		RECEIVED BY		DATE		TIME		FIELD REMARKS					
Frank Lamphere		12-3-96		15:30		[Signature]		12/4/96		1030							
RELINQUISHED BY (SIGNATURE)		DATE		TIME		RECEIVED BY		DATE		TIME							
RELINQUISHED BY (SIGNATURE)		DATE		TIME		RECEIVED BY		DATE		TIME							
REMARKS ON SAMPLE RECEIPT																	
<input checked="" type="checkbox"/> BOTTLE INTACT <input checked="" type="checkbox"/> CUSTODY SEALS <input checked="" type="checkbox"/> CHILLED <input checked="" type="checkbox"/> PRESERVED <input checked="" type="checkbox"/> SEALS INTACT <input type="checkbox"/> SEE REMARKS																	
SEND REPORT TO: 208120 WEEBUE12 5111 W. SCOTTSDALE RD H/28 SCOTTSDALE AZ 85258 602-990-0107																	



123313

**NO: 1574**

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Page 2 of 2

PROJECT #		PROJECT NAME		# OF CONTAINERS		MATRIX		REQUESTED PARAMETERS	
6018.21		TUCSON AVE		3		WATER			
SAMPLER: (PRINT NAME)		(SIGNATURE)		3		SOIL			
FRANK LAMPHIERE		[Signature]		3		GAS			
RECEIVING LABORATORY				3					
QUANTERRA 1721 S. GIRARD AVE. SANTA ANA, CA 92705 714-258-2610				3					
SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	ICE (%)	SAMPLING VOLUME	
MW101-U-96-2	12-3-96	09:30		X	SUB PUMP	HCL	Y	120ML	X
MW101-L-96-2	12-3-96	10:05		X	SUB PUMP	HCL	Y	120ML	X
MW102-U-96-2	12-3-96	11:15		X	SUB PUMP	HCL	Y	120ML	X
MW102-L-96-2	12-3-96	11:16		X	SUB PUMP	HCL	Y	120ML	X
MW102-L-96-2	12-3-96	11:50		X	SUB PUMP	HCL	Y	120ML	X
MW102-L-96-2	12-3-96	11:50		X	SUB PUMP	HCL	Y	120ML	X
MW100-L-96-2	12-3-96	13:05		X	SUB PUMP	HCL	Y	120ML	X
MW100-L-96-2	12-3-96	13:30		X	SUB PUMP	HCL	Y	120ML	X
BAKER TANK-102	12-3-96	14:30		X	DRAW	HCL	Y	120ML	X
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME	FIELD REMARKS	
[Signature]		12-3-96	15:30	[Signature]		12/1/96	1030	SEND 1 FAT RESULTS TO ROBIN WEESNER AT ERM - ARIZONA OFFICE 5111 N. Scottsdale R	
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME		
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME		
RELINQUISHED BY (SIGNATURE)		DATE	TIME	RECEIVED BY		DATE	TIME		
REMARKS ON SAMPLE RECEIPT		ERM REMARKS							
<input type="checkbox"/> BOTTLE INTACT <input type="checkbox"/> PRESERVED <input type="checkbox"/> CUSTODY SEALS <input type="checkbox"/> SEALS INTACT		<input type="checkbox"/> CHILLED <input type="checkbox"/> SEE REMARKS							
FAT 602-990-0107		SEND REPORT TO: 12031 N. WEESNER 5111 N. SCOTTSDALE RD SCOTTSDALE, AZ 85250							

SAMPLE DESCRIPTION INFORMATION  
for  
ERM-West, Inc.

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
123313-0001-TB	TB120296-1	WATER-QA	02 DEC 96		04 DEC 96
123313-0002-SA	MW93-L-96-2	AQUEOUS	02 DEC 96	17:10	04 DEC 96
123313-0003-SA	MW96-U-96-2	AQUEOUS	02 DEC 96	18:40	04 DEC 96
123313-0004-SA	MW96-U-96-2*	AQUEOUS	02 DEC 96	18:41	04 DEC 96
123313-0005-SA	MW96-L-96-2	AQUEOUS	02 DEC 96	19:10	04 DEC 96
123313-0005-MS	MW96-L-96-2	AQUEOUS	02 DEC 96	19:10	04 DEC 96
123313-0005-SD	MW96-L-96-2	AQUEOUS	02 DEC 96	19:10	04 DEC 96
123313-0006-SA	MW97-U-96-2	AQUEOUS	02 DEC 96	20:45	04 DEC 96
123313-0007-SA	MW97-L-96-2	AQUEOUS	02 DEC 96	21:15	04 DEC 96
123313-0008-SA	MW97-L-96-2*	AQUEOUS	02 DEC 96	21:15	04 DEC 96
123313-0009-SA	MW93-U-96-2	AQUEOUS	03 DEC 96	08:10	04 DEC 96
123313-0010-SA	MW93-U-96-2*	AQUEOUS	03 DEC 96	08:11	04 DEC 96
123313-0011-SA	MW101-U-96-2	AQUEOUS	03 DEC 96	09:30	04 DEC 96
123313-0012-SA	MW101-L-96-2	AQUEOUS	03 DEC 96	10:05	04 DEC 96
123313-0013-SA	MW102-U-96-2	AQUEOUS	03 DEC 96	11:15	04 DEC 96
123313-0014-SA	MW102-U-96-2*	AQUEOUS	03 DEC 96	11:16	04 DEC 96
123313-0015-SA	MW102-L-96-2	AQUEOUS	03 DEC 96	11:50	04 DEC 96
123313-0016-SA	MW102-L-96-2*	AQUEOUS	03 DEC 96	11:50	04 DEC 96
123313-0017-SA	MW100-L-96-2	AQUEOUS	03 DEC 96	13:05	04 DEC 96
123313-0018-SA	MW100-U-96-2	AQUEOUS	03 DEC 96	13:30	04 DEC 96
123313-0019-SA	BAKERTANK-96-2	AQUEOUS	03 DEC 96	14:30	04 DEC 96



# Del Mar Analytical

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16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, TB 120296-1  
Lab Number: FL00667

Sampled: Dec 2, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 108%

Results pertain only to samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

FL00667.QUN <1 of 20>



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 16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 93-L-96-2  
 Lab Number: FL00668

Sampled: Dec 2, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>19</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	104%

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FL00667.QUN <2 of 20>



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(818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 96-U-96-2  
Lab Number: FL00669

Sampled: Dec 2, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>18</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 105%

Results pertain only to samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.

FL00667.QUN <3 of 20>

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 96-U-96-2\*  
 Lab Number: FL00670

Sampled: Dec 2, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
 Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	109%

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# Del Mar Analytical

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 16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 96-L-96-2  
 Lab Number: FL00671

Sampled: Dec 2, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>22</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
 Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	110%

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FL00667.QUN <5 of 20>



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 16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1322

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 97-U-96-2  
 Lab Number: FL00672

Sampled: Dec 2, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	107%

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FL00667.QUN <6 of 20>





# Del Mar Analytical

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(909) 370-4667 FAX (909) 370-1046

16525 Sherman Way, Suite C-II, Van Nuys, CA 91406

(818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 97-L-96-2  
Lab Number: FL00673

Sampled: Dec 2, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>1.1</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 115%

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FL00667.QUN <7 of 20>



# Del Mar Analytical

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 16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1000

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 97-L-96-2\*  
 Lab Number: FL00674

Sampled: Dec 2, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>1.0</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	106%

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FL00667.QUN <8 of 20>



# Del Mar Analytical

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 16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 93-U-96-2  
 Lab Number: FL00675

Sampled: Dec 3, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>3.1</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 113%

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FL00667.QUN <9 of 20>



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16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 93-U-96-2\*  
Lab Number: FL00676

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	1.3
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 110%

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FL00667.QUN <10 of 20>



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 101-U-96-2  
Lab Number: FL00677

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>6.6</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 107%

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FL00667.QUN <11 of 20>



# Del Mar Analytical

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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1023

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 101-L-96-2  
Lab Number: FL00678

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>12</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	107%

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# Del Mar Analytical

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(818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 102-U-96-2  
Lab Number: FL00679

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>26</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 109%

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FL00667.QUN <13 of 20>



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16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1023

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 102-U-96-2\*  
Lab Number: FL00680

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
<b>Bromodichloromethane</b> .....	<b>1.0</b>	<b>1.9</b>
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
<b>Chloroform</b> .....	<b>1.0</b>	<b>1.6</b>
Chloromethane.....	1.0	N.D.
<b>Dibromochloromethane</b> .....	<b>1.0</b>	<b>1.1</b>
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 109%

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# Del Mar Analytical

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 16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 102-L-96-2  
 Lab Number: FL00681

Sampled: Dec 3, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>12</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	107%

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 16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
 2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1000

Quanterra Inc.  
 1721 S. Grand Ave.  
 Santa Ana, CA 92705  
 Attention: Keith Aleckson

Client Project ID: 123313  
 ERM-West/Tucson Ang.  
 Sample Descript: Water, MW 102-L-96-2\*  
 Lab Number: FL00682

Sampled: Dec 3, 1996  
 Received: Dec 4, 1996  
 Extracted: Dec 17, 1996  
 Analyzed: Dec 17, 1996  
 Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>11</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
 Project Manager

Surrogate Standard Recovery:
1-Chloro-3-fluorobenzene..... 107%

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FL00667.QUN <16 of 20>



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16525 Sherman Way, Suite C-II, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 100-L-96-2  
Lab Number: FL00683

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>16</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	105%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, MW 100-U-96-2  
Lab Number: FL00684


Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
<b>Chloroform.....</b>	<b>1.0</b>	<b>3.3</b>
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>7.1</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Marie Vaughn  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	102%

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FL00667.QUN <18 of 20>



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(818) 779-1844 FAX (818) 779-1843

2465 W. 12th St., Suite 1, Tempe, AZ 85281

(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123313  
ERM-West/Tucson Ang.  
Sample Descript: Water, Baker Tank-96-2  
Lab Number: FL00685

Sampled: Dec 3, 1996  
Received: Dec 4, 1996  
Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>3.2</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 111%

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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1023

Quanterra Inc.  
1721 S. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

## Method Blank

Extracted: Dec 17, 1996  
Analyzed: Dec 17, 1996  
Reported: Dec 18, 1996  
Matrix: Water

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Marie Vaughn  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 104%

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FL00667.QUN <20 of 20>

## MS/MSD DATA REPORT

**EPA Method 601/602**

Matrix: Water

**Date:** 12/17/96

**Sample #:** FL00671

**Batch #:** FL17111W

<u>Analyte</u>	<u>R1</u>	<u>Sp</u>	<u>MS</u>	<u>MSD</u>	<u>PR1</u>	<u>PR2</u>	<u>RPD</u>	<u>Mean PR</u>	<u>Acceptance Limits</u>	
	ppb	ppb	ppb	ppb	%	%	%	%	<u>RPD</u>	<u>Mean PR</u>
Benzene	0	10	10	10	103	100	2.8	102	≤ 10	70 - 130
Chloroform	0	10	11	11	108	107	1.2	108	≤ 25	70 - 130
1,1-Dichloroethane	0	10	9.7	9.7	97	97	0.069	97	≤ 10	70 - 130
1,2-Dichloroethane	0	10	11	10	106	102	3.4	104	≤ 10	70 - 130
1,1-Dichloroethene	0	10	10	11	102	105	2.7	104	≤ 11	70 - 130
Tetrachloroethene	0.083	10	9.9	9.9	98	98	0.0053	98	≤ 10	70 - 130
Toluene	0.55	10	10	10	99	94	4.6	97	≤ 19	70 - 130
Trichloroethene	22	10	29	30	69	81	15	* 75	≤ 11	70 - 130

### Definition of Terms

- R1..... Result of Sample Analysis
- Sp..... Spike Concentration added to sample
- MS..... Matrix Spike Result
- MSD..... Matrix Spike Duplicate Result
- PR1..... Percent Recovery of MS;  $((MS-R1)/SP) \times 100$
- PR2..... Percent Recovery of MSD;  $((MSD-R1)/SP) \times 100$
- RPD..... Relative Percent Difference;  $((MS-MSD)/(MS+MSD)/2) \times 100$
- Mean PR..... Mean Percent Recovery
- Acceptance Limits ..... Determined by in-house Control Charts

## LCS DATA REPORT

**EPA Method 601/602**

Matrix: Water

**Date:** 12/17/96

**Batch #:** FL17111W

<u>Analyte</u>	<u>Spike Conc.</u>	<u>Result</u>	<u>% Recovery</u>	<u>ACP</u>
----------------	--------------------	---------------	-------------------	------------

Benzene	10	9.9	99	80 - 120 %
Chloroform	10	11	113	80 - 120 %
1,1-Dichloroethane	10	10	101	80 - 120 %
1,2-Dichloroethane	10	11	112	80 - 120 %
1,1-Dichloroethene	10	9.2	92	80 - 120 %
Tetrachloroethene	10	9.4	94	80 - 120 %
Toluene	10	9.8	98	80 - 120 %
Trichloroethene	10	11	107	80 - 120 %

### Definition of Terms

**LCS** ..... Laboratory Control Sample

**Spike Conc** ..... Result of Sample Analysis

**Result** ..... Result of Laboratory Control Sample Analysis

**%Recovery** ..... Percent Recovery of LCS; ((Result - Spike Conc.) / Spike Conc.) X 100

**ACP** ..... Acceptance Limits for Percent Recovery

**Del Mar Analytical**



# Chain of Custody Record

OUA-4124-1  
Client

QES-S.A.  
Address 1721 S. GRAND  
City SANTA ANA State CA Zip Code 92705  
Project Name ERM-west / TUCSON ANG  
Purchase Order/Quote # 123313

Project Manager

Kathy Aleckson

Telephone Number (Area Code) Fax Number

(714) 258-8610

Site Contact

Lab Contact

Carrier/Waybill Number

123313

Date

12/4/96

Lab Number

123313

Page

1 of 2

Chain Of Custody Number

61715

Analysis (Attach list if more space is needed)

MS/MSD

Special Instructions/  
Conditions of Receipt

Sample I.D. No. and Description

(Containers for each sample may be combined on one line)

Sample I.D. No. and Description	Date	Time	Matrix					Containers & Preservatives					Special Instructions/ Conditions of Receipt
			Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc	NaOH	
TB 120296-1	12-2-96	—	✓						2				123313-001
MW 93-L-96-2	"	17:10	✓						3				-002
MW 96-U-96-2	"	18:40	✓						3				-003
MW 96-U-96-2 *	"	18:41	✓						3				-004
MW 96-L-96-2	"	19:10	✓						9				-005
MW 97-U-96-2	"	20:45	✓						3				-006
MW 97-L-96-2	"	21:15	✓						3				-007
MW 97-L-96-2 *	"	21:15	✓						3				-008
MW 93-U-96-2	12-3-96	08:10	✓						3				-009
MW 93-U-96-2 *	12-3-96	08:11	✓						3				-010
MW 101-U-96-2	12-3-96	09:30	✓						3				-011
MW 101-U-96-2	12-3-96	10:05	✓						3				-012

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Turn Around Time Required ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other

1. Relinquished By Andy Ticon Date 12/4/96 Time 16:30

2. Relinquished By P. Aleckson Date 12-4-96 Time 17:10

3. Relinquished By P. Aleckson Date 12/4/96 Time 17:10

Comments

(A fee may be assessed if samples are retained longer than 3 months)

☐ Archive For ☐ Disposal By Lab ☐ Return To Client

QC Requirements (Specify)

1. Received By P. Aleckson Date 12-4-96 Time 16:30

2. Received By P. Aleckson Date 12-4-96 Time 17:10

3. Received By P. Aleckson Date 12/4/96 Time 17:10

DISTRIBUTION: WHITE - Slays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy



FINAL

APPENDIX B

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*DATA VALIDATION REPORT*

DATA VALIDATION REPORT FOR VOLATILE ORGANIC ANALYTICAL  
DATA FOR SAMPLES COLLECTED ON NOVEMBER 21, 1996 FROM THE AIR  
ARIZONA NATIONAL GUARD BASE TUCSON, ARIZONA

QUANTERRA LABORATORY - SANTA ANA  
WORK ORDER No. 123137-0001-0009

Prepared for the  
National Guard

March 1997

ERM File: 123137 VOA Tucson

## NARRATIVE

Seven samples, matrix spike and matrix spike duplicate sample pair, one field duplicate, and one trip blank were collected by ERM-West (ERM) from the Arizona Air National Base in Tucson, Arizona, on November 21, 1996. The samples were relinquished by ERM under documented chain-of-custody on November 21, 1996 for transport via Federal Express to Quanterra Laboratory located in Santa Ana, California.

The samples included in this sample delivery group (SDG) were characterized as follows:

ERM Sample I.D.	Laboratory Sample I.D.	Level/ Matrix	Date Collected
TB112196-1	123137-0001-TB	low/water	11/21/96
MW03-L-96-2	123137-0002-SA	low/water	11/21/96
MW03-U-96-2	123137-0003-SA	low/water	11/21/96
MW71-U-96-2	123137-0004-SA	low/water	11/21/96
MW71-L-96-2	123137-0005-SA	low/water	11/21/96
MW04-U-96-2	123137-0006-SA	low/water	11/21/96
MW42-L-96-2	123137-0007-SA	low/water	11/21/96
MW92-U-96-2	123137-0008-SA	low/water	11/21/96
MW71-L-96-2*	123137-0009-SA	low/water	11/21/96

Quanterra selected the non-project sample FK04036 for the matrix spike/matrix spike duplicate.

The appropriate analytical level for the sample analysis was determined by a preliminary sample screening or at the actual time of sample analysis.

Halogenated purgeable volatile data were acquired according to the U. S. EPA SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Method 8010B (November 1986, Third Edition, Volume 1B, Revision 2, September 1994 ).

Validation of these data were based on the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (9240.1-05) (Office of Solid Waste and Emergency Response, PB94-9635-1, EPA-540/R-94/012, U. S. Environmental Protection Agency, Washington, D. C., February 1993). (Organic Functional Guidelines).

The areas reviewed during the data validation procedure are enumerated as follows:

### I. Technical Holding Times

- II. Initial Calibration
- III. Continuing Calibration
- IV. Blanks
- V. System Monitoring Compounds (Surrogate Spikes)
- VI. Matrix Spike/Matrix Spike Duplicates
- VII. Laboratory Control Samples
- VIII. Regional Quality Assurance and Quality Control
- IX. Target Compound Identification
- X. Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs)
- XI. System Performance
- XII. Overall Assessment of Data
- XIII. Documentation

All laboratory results have been either accepted (unqualified), qualified or rejected.

Unqualified results are valid with respect to the specified procedures, and may be used without reservations.

Qualified results are usable with the indicated limitation.

Rejected results are unusable. The analyte may or may not be present. Resampling and reanalysis will be necessary for verification.

Qualified and rejected results are annotated in accordance with the Functional Guidelines with the following codes:

- U - The analyte was analyzed for, but was not detected above the associated value.
- J - The associated numerical value is an estimated quantity.
- R - The data are unusable. The presence or absence of the analyte cannot be verified from the existing data. Resampling and reanalysis is necessary for verification.
- N - There is presumptive evidence to make a tentative identification.

- NJ - There is presumptive evidence to make a tentative identification and the associated numerical value is an estimated quantity.
- UJ - The analyte was analyzed for, but was not detected above the reported value. The associated value is an estimate.

## DATA VALIDATION RESULTS

### I. HOLDING TIMES

Quanterra provided ERM volatile sample vials for water samples with the hydrochloric acid preservative preadded. All water samples were analyzed within the specified 14-day holding time.

### II. INITIAL CALIBRATION

The GC employed for samples or associated quality control samples was calibrated independently, as appropriate for water samples, at eight concentration levels. Each calibration standard contained all target compounds and all surrogates.

The initial calibration is summarized as follows:

GC Instrument ID	Date	Time
GC11	12/01/96	1820 - 2227

Each of the correlation coefficients were greater than or equal to 0.995. None of the data were qualified based on the initial calibration results.

It should be noted that the laboratory performed correlation coefficient calculations for the initial calibration. The laboratory chose to evaluate the continuing calibration using percent recovery.

### III. CONTINUING CALIBRATION

The GC was calibrated for each subsequent 12-hour shift in which samples or associated quality control samples included in this SDG were analyzed. The continuing calibration was performed at one concentration level with a standard containing all target compounds and all surrogates.

The continuing calibration is summarized as follows:

GC Instrument ID	Date	Time
GC11	12/03/96	1010

Each of the percent recoveries for the target compounds were  $\pm 25$  percent or less. None of the data were qualified based on the continuing calibration.



#### IV. BLANKS

The following method blank was associated with these samples:

Blank ID	Level/ Matrix	GC Instrument I.D.	Date	Time
3 Dec 96-AFX	low/water	GC11	12/3/96	1050

No target compounds were reported in this method blank.

The following trip blank was associated with these samples:

Sample ID	Level/ Matrix	GC Instrument I.D.	Date	Time
TB112196-1	low/water	GC11	12/2/96	1400

No target compounds were reported in this blank.

#### V. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate percent recoveries (%Rs) were within the specified quality control limits .

No data were qualified based on surrogate spike recoveries.

#### VI. MATRIX SPIKE AND MATRIX SPIKE DUPLICATES

The following non-project matrix spike/matrix spike duplicate (MS/MSD) sample pair were associated with these samples:

Sample ID	Level/ Matrix	GC Instrument I.D.	Date	Time
FK04036MS	low/water	NP	12/3/96	NP
FK04036MSD	low/water	NP	12/3/96	NP

NP - Not Provided

The MS/MSD percent recoveries (%Rs) and relative percent differences (RPDs) were within specified quality control limits.

No data were qualified based on MS/MSD percent recoveries or relative percent differences.

## VII. LABORATORY CONTROL SAMPLES

The following laboratory control sample (LCS) sample was associated with these samples:

Sample ID	Level/ Matrix	GC Instrument I.D.	Date	Time
3 Dec 96-LCS	low/water	GC11	12/3/96	1335

The LCS percent recoveries (%Rs) were within specified quality control limits.

No data were qualified based on LCS percent recoveries.

## VIII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

No Regional Quality Assurance and Quality Control samples were included in this SDG.

## IX. TARGET COMPOUND IDENTIFICATION

All target compound identifications were not second confirmed, however, the results agreed with historical data. None of the data were qualified based on the lack of second dissimilar confirmation.

## X. COMPOUND QUANTITATION AND REQUIRED QUANTITATION LIMITS (CRQLs)

All target compound quantitations were acceptable with regard to the supporting data, with the above noted exception.

## XI. SYSTEM PERFORMANCE

There were no marked changes in instrument performance during the course of analysis of the samples included in this SDG.

## XII. OVERALL ASSESSMENT

None of the data required qualification based on the validation performed by ERM for this SDG.

### XIII. DOCUMENTATION

The field sample identification and laboratory sample identifications enumerated in the Quanterra Sample and Analysis Summary (SAS) had been verified for receiving data input into the ERM data management system. These identifications were utilized during the data validation process.

## VALIDATED DATA

The Volatile Organics Analysis Data Sheets with the data validation qualifiers applied by ERM are provided in this section.



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, TB112196-1 (-001)  
Lab Number: FK04036

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

  
Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	104%

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FK04036.QUN <1 of 10>

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW03-L-96-2 (-002)  
Lab Number: FK04037

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>1.8</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 104%

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FK04036.QUN <2 of 10>



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2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW03-U-96-2 (03)  
Lab Number: FK04038

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 99%

Nick Haring  
Project Manager

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FK04036.QUN <3 of 10>

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(602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW71-U-96-2 (-004)  
Lab Number: FK04039

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>2.8</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>9.3</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

### Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 102%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1313

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW71-L-96-2 (-05)  
Lab Number: FK04040

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>14</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 98%

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# Del Mar Analytical

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW04-U-96-2 (-006)  
Lab Number: FK04041

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
<b>Tetrachloroethene.....</b>	<b>1.0</b>	<b>2.2</b>
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>11</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 103%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1025  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1023

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW42-L-96-2 (-007)  
Lab Number: FK04042

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

### HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit		Sample Result	
	µg/L	(ppb)	µg/L	(ppb)
Bromodichloromethane.....	1.0	.....	N.D.	
Bromoform.....	1.0	.....	N.D.	
Bromomethane.....	1.0	.....	N.D.	
Carbon tetrachloride.....	1.0	.....	N.D.	
Chlorobenzene.....	1.0	.....	N.D.	
Chloroethane.....	1.0	.....	N.D.	
2-Chloroethylvinyl ether.....	1.0	.....	N.D.	
Chloroform.....	1.0	.....	N.D.	
Chloromethane.....	1.0	.....	N.D.	
Dibromochloromethane.....	1.0	.....	N.D.	
1,2-Dichlorobenzene.....	1.0	.....	N.D.	
1,3-Dichlorobenzene.....	1.0	.....	N.D.	
1,4-Dichlorobenzene.....	1.0	.....	N.D.	
1,1-Dichloroethane.....	1.0	.....	N.D.	
1,2-Dichloroethane.....	1.0	.....	N.D.	
1,1-Dichloroethene.....	1.0	.....	N.D.	
cis-1,2-Dichloroethene.....	1.0	.....	N.D.	
trans-1,2-Dichloroethene.....	1.0	.....	N.D.	
1,2-Dichloropropane.....	1.0	.....	N.D.	
cis-1,3-Dichloropropene.....	1.0	.....	N.D.	
trans-1,3-Dichloropropene.....	1.0	.....	N.D.	
Methylene chloride.....	1.0	.....	N.D.	
1,1,2,2-Tetrachloroethane.....	1.0	.....	N.D.	
Tetrachloroethene.....	1.0	.....	N.D.	
1,1,1-Trichloroethane.....	1.0	.....	N.D.	
1,1,2-Trichloroethane.....	1.0	.....	N.D.	
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>.....</b>	<b>16</b>	
Trichlorofluoromethane.....	1.0	.....	N.D.	
Vinyl chloride.....	1.0	.....	N.D.	
Dichlorodifluoromethane.....	5.0	.....	N.D.	

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:

1-Chloro-3-fluorobenzene..... 102%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW92-U-96-2 (-008)  
Lab Number: FK04043

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>9.8</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	97%

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1845  
2465 W. 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338

Quanterra Inc.  
1721 So. Grand Ave.  
Santa Ana, CA 92705  
Attention: Keith Aleckson

Client Project ID: 123137  
ERM-West  
Sample Descript: Water, MW71-L-96-2 (-009)  
Lab Number: FK04044

Sampled: Nov 21, 1996  
Received: Nov 22, 1996  
Extracted: Dec 3, 1996  
Analyzed: Dec 3, 1996  
Reported: Dec 4, 1996

## HALOGENATED VOLATILE ORGANICS by GC (EPA 5030/8010)

Analyte	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	1.0	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
<b>Trichloroethene.....</b>	<b>1.0</b>	<b>12</b>
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.
Dichlorodifluoromethane.....	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

DEL MAR ANALYTICAL (ELAP #1197)

Nick Haring  
Project Manager

Surrogate Standard Recovery:	
1-Chloro-3-fluorobenzene.....	97%

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